

# InfoWorld

The Newsweekly for Microcomputer Users

October 4, 1982

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## CARING FOR YOUR COMPUTER

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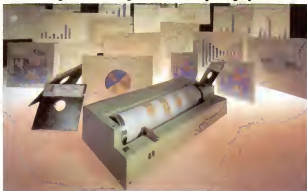
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# InfoWorld

The Newsweekly for Microcomputer Users

## IBM sues senior executives for trade-secrets theft

Tecmar helps Big Blue uncover plot to sell proprietary personal-computer information

By David Needle, *IW Staff*

ARMONK, NY—IBM has apparently foiled a scheme by three of its own senior employees to sell proprietary information on future, as yet unannounced, products developed by IBM for the personal-computer field.

IBM filed a civil lawsuit against the threesome, who had formed a com-

pany called Bridge Technology, for "misappropriation of IBM trade secrets." IBM also obtained a temporary restraining order that prohibits Bridge Technology and affiliated persons from revealing confidential information concerning IBM and to return any such information in their possession.

IBM said it fired all three of the de-

fendants prior to filing the suit, although, according to the *New York Times*, one of the three, William W. Erdman, claims he resigned over a week before the firings took place to join a non-computer-related company. Erdman also denied being a principal in Bridge Technology and was quoted in the *Times* as saying he

had "no association whatsoever" with the firm. Erdman is described as a key figure and negotiator for Bridge Technology in two of the affidavits filed by IBM, however. *InfoWorld* was unable to contact any of the three alleged partners.

The filing of the suit followed a month-long investigation by IBM that had some elements of the widely publicized joint FBI/IBM "Techscan" operation this past June. (That investigation resulted in the arrest of officials from Hitachi and Mitsubishi Electric Corporation on charges of trying to steal trade secrets from IBM.) This current action apparently involved only

See *IBM suit*, page 3

## Axlon boosts RAM, shrinks terminal size

By Scott Mace, *IW Staff*

SUNNVALE, CA—"Keep it simple" is an expression that gets a lot of lip service in the microcomputer industry. A young company here gives that expression new meaning by bringing calculator technology to portable terminals and add-in memory boards.

The company, Axlon, has released a string of products in 1982, and Axlon president John Vurich says the company is already making a profit.

Vurich's prime concern is that Axlon not produce "me-too" hardware products. Axlon's RAMDISK, released at the start of 1982, showed that he meant what he said. Inside a box that looked like a disk drive, but with no disk door, was 320K of RAM storage that could replace two Apple disk drives and speed up access time. It all came with a three-hour battery backup in case of power failure. The system cost \$1395.

Axlon also released a series of boards for the Apple and Atari computers that allowed home users to expand memory and shorten memory access time.

The key to these products' low cost was a component much talked about but, as yet, not widely used in the industry—the 64K RAM chip, which takes the place of the standard four 16K RAM chips.

The latest of these boards, announced in September, is a 48K memory-expansion module for the Atari 400 home computer. Previously, Atari 400 owners were limited to a maximum of 32K RAM. Now, the RAM-CRAM Plus 48K provides Atari 400 owners with 48,062 bytes of RAM in a single module, so that the Atari 400

See *Axlon*, page 3



John Vurich, president of Axlon, holds his company's RAMDISK for the Atari 800.

## Chemical Bank unveils Pronto

Home banking system offered to NY Atari owners

By Deborah Wise, *IW Staff*

NEW YORK, NY—Chemical Bank has announced it will offer Pronto, an electronic home banking and information system, to a limited number of New York-area checking-account customers who have personal computers by the end of this year.

For a monthly user fee of between \$8 and \$10, subscribers who own Atari 400 or 800 home computers and modems will be able to link up with Chemical's computer center in Somerset, New Jersey, to perform a variety of banking transactions and budgeting chores in their homes, according to John Farnsworth, senior vice-president of the financial-services division.

The cheapest Pronto system configuration will cost \$249 for the Atari 400 and an additional \$200 for the modem. There is a subscription fee and local telephone-call charges via Tymnet or Teletel to the central Chemical Bank computers are extra.

Chemical, the nation's sixth largest bank, is the first of the major banking institutions to branch out into electronic services. (Two smaller banks, however, one in Knoxville, Tennessee, and one in North Dakota, already offer home banking.)

Chemical has been testing Pronto in about 200 homes since November 1981 and expects between 2000 and 3000 people to sign up for the home-banking system by next year. It said the system will be available for Xerox, Apple and IBM personal computers later in 1983.

Pronto works like ordinary applications software. Subscribers receive the Pronto software cartridge and a manual that explains how to utilize the services offered.

Subscribers key commands on the computer in simple English to perform such traditional banking services as balance inquiry, checkbook balancing and transfer of funds. In addition

See *Home banking*, page 4

## Huge music data swells

Pop tunes bust charts

By John Markoff, *IW Staff*

WANTED: A GOOD HOME FOR THE WORLD'S LARGEST ON-LINE DATA BASE OF POPULAR 45 RPM RECORDS. MORE THAN 70 MEGABYTES OF INFORMATION. 100,000 DIFFERENT RECORDINGS GOING BACK AS FAR AS 1947. EACH RECORD LOVINGLY ENTERED BY HAND.

Paul Mawhinney has a problem. Since 1968 he has been painstakingly collecting information for Musicmaster, the nation's first computerized record and information service. Mawhinney, the owner of Record-Rama, an Allison Park, Pennsylvania, record store, has put together a unique data base that identifies the title, artist, company, pressing number and even the record category of virtually every popular recording made in this country since 1947.

There's just one hitch. The Musicmaster collection has now grown to such a size, 70 megabytes, that Mawhinney is having trouble interesting major electronic-information providers such as The Source, CompuServe and Lockheed Dialog in giving his data base a home.

"I've had discussions with the major electronic-information companies," he says, "but many of them have told me that I've just got too much information for them to handle."

See *Musicmaster*, page 5

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### IN FOCUS

You probably hope that no one will ever have to repair your computer, but someday you may need to know something about support and service. See page 21 for an in-depth look at this topic—of special interest is our chart comparing support for major microcomputers (page 27).



This One



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InfoWorld 1

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# IBM suit

*continued from page 1*

IBM security personnel, not outside law-enforcement investigators, and officials at Tecmar, a Cleveland-based manufacturer of expansion boards for the IBM PC.

IBM has filed a civil rather than criminal suit. One reason IBM may have decided to take a civil action is to avoid the "entrapment defense" that Hitachi is using in its case with IBM, noted Gerry Davis, a senior member in the law firm of Schroeder & Davis which specializes in computer law and business matters related to the computer industry.

Another possible reason cited by Davis is that civil cases are generally easier to prosecute because often the judge (no jury is involved) will allow more evidence to be submitted, possibly even secretly taped conversations. The civil action may also be a more effective means for IBM to limit the number of people involved in the case, thereby further restricting how much of the proprietary information becomes available, noted Davis.

According to IBM, the three employees—Lewis G. Eggebrecht, a senior engineer in IBM's Systems Products division; Peter J. Stearns, a senior engineer in the Communication Products division; and Erdman, who had been assigned to IBM's World Trade Americas/Far East Corporation—were involved in and/or had access to both technical and marketing information related to IBM's future planned products in the personal-computer field.

## Play along

IBM alleges in its affidavit that the trio set up Bridge Technology to sell proprietary design information on IBM's personal-computer products to manufacturers of add-on boards and other peripheral devices for the IBM PC and also planned to manufacture and market such devices itself.

IBM claims it obtained its information from officials at Tecmar, to which Bridge Technology allegedly tried to sell the proprietary design information. Martin Alpert, president of Tecmar, said he alerted IBM to the scheme and agreed to play along while secretly taping conversations he had with Bridge Technology officials for IBM.

"This was my first and only involvement in anything like this, and the ex-

perience was not pleasant," Alpert told *InfoWorld*. "We did what any other businessman with integrity would've done."

IBM alleges that Erdman told David Wertman, Tecmar's vice-president of marketing, that he had designs for approximately 40 products related to the PC and was looking for a company like Tecmar to go into business with. Alpert also told *InfoWorld* that Erdman claimed to have contacted several other manufacturers as well, although he refused to name them.

An affidavit filed by Richard E. Mainey, an IBM security official, detailed many of the conversations between Erdman and Tecmar officials, some of which may have been taped. Erdman was said to have described

two of "his" products in depth. The first was a "combination board" for the IBM PC that would give it additional memory, serial and parallel functions. The second product was only described in the affidavit as having "the potential of substantial commercial significance to IBM..."

The IBM affidavit filed by Tecmar's Alpert quotes Erdman in a tape-recorded conversation as telling him: "I have contacts from, you know, Don Estridge [head of IBM's Personal Computer division] on down in terms of the PC and there's contacts sprinkled throughout the organization from key design people all the way down through software implementation people."

"We'll be pulling off some of those

people, and we've identified the fourteen key people associated with IBM's small systems, and you know, over a period of time we've talked to them and, in effect, if we build an organization, we'll be pulling those people with us as the need occurs."

Whether there were other IBM employees involved in Bridge Technology's scheme is not entirely clear, but another alleged conversation between Erdman and Alpert would seem to indicate others in IBM knew of Bridge Technology's plans: "I guarantee you that we know more about the way IBM's going to put it together [PC products] than IBM knows, because when the guys that we're talking about leave, a good deal of knowledge leaves with them."

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# Axlon

*continued from page 1*

can equal the more expensive Atari 800 in computing power.

RAMCRAM was ingeniously made plug-compatible with the 400—perhaps the first board for the 400 that requires no soldering. You can install the RAMCRAM Plus 48K in the 400 in less than ten minutes using only a screwdriver. Axlon socketed the board into the decoder chip on the main 400 board. The RAMCRAM Plus 48K is compatible with existing read-only memory (ROM) cartridges for the Atari 400 and retails for \$229.95.

Axlon also sells the RAMCRAM with 16K for the Atari 400 or 800, a \$149 pro-

See Axlon, page 4

## Home banking

*continued from page 1*

Pronto has what Chemical calls "a critical mass of value-added services." These include bill-paying services, electronic mail and home budget management.

Pronto subscribers can make bill payments directly on the system to about 250 New York-area merchants and utilities such as, Bloomingdale's, Saks Fifth Avenue, Con Edison and New York Telephone.

In addition to banking services, Chemical said it will offer financial-management software products like stock-quotation programs and portfolio management. It also wants to offer teleshopping and possibly put classi-

fied advertising on the system.

"We have explored a number of opportunities for creating partnerships," admitted Farnsworth.

"I think it is a good system. Chemical is responding not only to an opportunity but to other competitive threats," observed Mark Plakias, director of research at Link Resources, a New York-based market-research firm. Plakias said in the future banks will have to offer value-added services, like portfolio management, to maintain their customer base in the face of competition from diverse financial institutions that offer higher interest rates and, therefore, greater returns on investments. (Chemical Bank already sells securities through its branches.)

As a value-added product, Pronto

also offers home budgeting and electronic mail, Plakias noted. He added that Chemical has a few months' head-start on competition from videotex services due to be offered by such companies as Times-Mirror and Time, Inc., in 1983.

The home-budgeting function is one of Pronto's novel features. It lets you keep track of expenditures and income. In addition, you can monitor credit-card use by calling up your credit-card statement at anytime to see how many and when purchases were made.

The electronic mail and messaging function allows Pronto users to send messages to the bank or to other Pronto users.

Each subscribing household gets a

household identification number that is kept in an electronic directory. Members of the house choose names or "handles" for their accounts, and these too are listed in a directory.

If a Pronto user wishes to send a message to another Pronto subscriber but has forgotten the household code or the family member's handle, he can search the directory using the person's surname.

Security is obviously a major concern for any type of banking transactions, and Chemical has embedded a hierarchical security system into its software. Each user has a private "personal identification code" in addition to a commonly known household number and a personal handle. This code never appears on the screen and can be changed easily by the user at any time, according to Chemical.

"The system is very secure. There are many levels of security built into

[See Home banking, page 5](#)

"EMERITUS OFFERS US SOMETHING A LOT OF OTHER DISTRIBUTORS DON'T."

# support

Dee Justesen, owner of Hometown Computer Service in Salt Lake City, and in Payson, Utah, explains what makes Emeritus the kind of distributor he likes to do business with.

"It's the people and the service that make the difference. When a customer of ours has a problem, it needs immediate attention. Emeritus doesn't wait for the manufacturer to take care of it. They jump right in and handle it themselves. We can always count on Emeritus to help us help our people."

"I really can't say enough about Emeritus. They offer an excellent product — TeleVideo — at a good price. And when they say they'll do something, they do it I never have to follow up. We're delighted to deal with someone we can count on! "And we're not the only ones. Other dealers are as happy as we are. There's a regular dealer grapevine, and when someone treats you right, word gets around. In our business, there's nothing more important than TOTAL SUPPORT. And we get it from Emeritus!"



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## Axlon

*continued from preceding page*

duct (Vurich has sold 20,000 of them); and the RAMDISK for the Atari 800, a \$589 plug-in 128K memory module that you can use as an additional disk device or as bank-selectable RAM memory. Vurich said the RAMDISK system, according to measurements, is up to 2000% faster than the Atari 810 disk drives.

Eventually, the RAMDISK series will also be available for the IBM Personal Computer.

Memory isn't Vurich's only interest. Axlon has also released a simple 13-ounce hand-held terminal with built-in modem, tentatively dubbed the Datalink.

Vurich said the Datalink is smaller than the competitive IXO terminal, but Axlon's terminal employs a simpler alphanumeric keyboard. The terminal displays up to 16 green fluorescent characters at once. Vurich shunned the popular liquid-crystal display used in so many hand-held machines to avoid the "ghosting" problems that occur during character scrolling on LCDs.

The \$400 Datalink stores and can play back the last 224 characters received. You can select character speeds of 110 and 300 baud. Perhaps the most unusual feature of all is the built-in documentation, which is printed on the underside, as on many calculators.

Vurich is no newcomer to the world of processor chips and prototype micros. He started out at Motorola, where he worked with 6502 developer (and founder of Sirius Systems) Chuck Peddle. In the early 70s, Vurich moved on to National Semiconductor, where he met Atari founder Nolan Bushnell.

After an unsuccessful attempt to get National to build a computer, Vurich joined Atari, where he was product-planning manager of the home-computer division.

After leaving Atari to form Axlon with Bushnell on April Fools' Day in 1980, Vurich had a string of good ideas that didn't come to fruition, but might someday—such as a food-ordering terminal for customers to use at a restaurant like McDonald's or Bushnell's Pizza Time Theater.

# Musicmaster

*continued from page 1*

Mawhinney is disappointed and frustrated because he feels that he has a resource that would be very useful to record collectors as well as to people with more general interests—if it could be made available.

He has also found himself with a problem somewhat akin to having a puppy that has suddenly grown so large that it is eating its owner out of house and home. Mawhinney is now paying a local mainframe timesharing company with Prime computers about \$2000 a month to care for this data base. As you might guess, the Record-Rama owner is also a record collector. He claims to have the largest archives of 45 RPM records outside the Library of Congress—about 1½ million records.

It all started in 1968 when Mawhinney left his job as a salesman and decided to do something he liked. He came across a collection of 140,000 singles and opened Record-Rama in suburban Pittsburgh, where he sold records at 99 cents a pound. At about the same time, he started a 3 X 5 card index of each record in stock. By 1977, the card file had grown to over 35,000 and become totally unmanageable. It was then that Mawhinney considered moving his data base to a computer.

The next year he began to put his collection on line. Mawhinney plans on publishing the data base, called Musicmaster, next year as an aid to record collecting and cataloging.

Musicmaster has many uses. Recently, Warner Brothers called Mawhinney and asked him for a listing of all of the pre-1974 releases from Electra Records, its own label. Mawhinney had a printout in seconds. He charged Warner \$100.

To demonstrate Musicmaster's abilities, Mawhinney sent *InfoWorld* printouts of the 62 different Neil Diamond recordings (with the several separate pressings of each recording; all the songs with the word *surfing* in the title 128; and all the songs with the

word *John* in the title over 100).

The Musicmaster data base is also the only source available for generating a complete list of all Christmas records. In addition, the records are tagged with mnemonics—"Birthday tunes for piano" or "Irish drinking songs," for example. With the 50-plus mnemonics, Musicmaster can generate complete lists of all Irish, Italian, Jewish or even birthday records.

For the future, Mawhinney is still looking for a permanent home for Musicmaster. "My prediction is that digital laser-read disks will replace traditional records entirely in the next ten years. Traditional recordings will become white elephants, and as a result, my reference will be much more important in the future."

17492 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1080	1118 B	0 03	1117 B	0 04-PC
17493 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1081	1117 B	0 03	1118 B	0 04
17494 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1082	1117 B	0 03	1119 B	0 04
17495 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1083	1117 B	0 03	1120 B	0 04
17496 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1084	1117 B	0 03	1121 B	0 04
17497 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1085	1117 B	0 03	1122 B	0 04
17498 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1086	1117 B	0 03	1123 B	0 04
17499 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1087	1117 B	0 03	1124 B	0 04
17500 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1088	1117 B	0 03	1125 B	0 04
17501 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1089	1117 B	0 03	1126 B	0 04
17502 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1090	1117 B	0 03	1127 B	0 04
17503 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1091	1117 B	0 03	1128 B	0 04
17504 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1092	1117 B	0 03	1129 B	0 04
17505 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1093	1117 B	0 03	1130 B	0 04
17506 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1094	1117 B	0 03	1131 B	0 04
17507 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1095	1117 B	0 03	1132 B	0 04
17508 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1096	1117 B	0 03	1133 B	0 04
17509 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1097	1117 B	0 03	1134 B	0 04
17510 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1098	1117 B	0 03	1135 B	0 04
17511 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1099	1117 B	0 03	1136 B	0 04
17512 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1100	1117 B	0 03	1137 B	0 04
17513 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1101	1117 B	0 03	1138 B	0 04
17514 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1102	1117 B	0 03	1139 B	0 04
17515 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1103	1117 B	0 03	1140 B	0 04
17516 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1104	1117 B	0 03	1141 B	0 04
17517 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1105	1117 B	0 03	1142 B	0 04
17518 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1106	1117 B	0 03	1143 B	0 04
17519 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1107	1117 B	0 03	1144 B	0 04
17520 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1108	1117 B	0 03	1145 B	0 04
17521 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1109	1117 B	0 03	1146 B	0 04
17522 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1110	1117 B	0 03	1147 B	0 04
17523 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1111	1117 B	0 03	1148 B	0 04
17524 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1112	1117 B	0 03	1149 B	0 04
17525 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1113	1117 B	0 03	1150 B	0 04
17526 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1114	1117 B	0 03	1151 B	0 04
17527 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1115	1117 B	0 03	1152 B	0 04
17528 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1116	1117 B	0 03	1153 B	0 04
17529 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1117	1117 B	0 03	1154 B	0 04
17530 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1118	1117 B	0 03	1155 B	0 04
17531 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1119	1117 B	0 03	1156 B	0 04
17532 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1120	1117 B	0 03	1157 B	0 04
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17538 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1126	1117 B	0 03	1163 B	0 04
17539 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1127	1117 B	0 03	1164 B	0 04
17540 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1128	1117 B	0 03	1165 B	0 04
17541 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1129	1117 B	0 03	1166 B	0 04
17542 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1130	1117 B	0 03	1167 B	0 04
17543 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1131	1117 B	0 03	1168 B	0 04
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17546 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1134	1117 B	0 03	1171 B	0 04
17547 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1135	1117 B	0 03	1172 B	0 04
17548 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1136	1117 B	0 03	1173 B	0 04
17549 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1137	1117 B	0 03	1174 B	0 04
17550 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1138	1117 B	0 03	1175 B	0 04
17551 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1139	1117 B	0 03	1176 B	0 04
17552 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1140	1117 B	0 03	1177 B	0 04
17553 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1141	1117 B	0 03	1178 B	0 04
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17562 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1150	1117 B	0 03	1187 B	0 04
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17564 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1152	1117 B	0 03	1189 B	0 04
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17567 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1155	1117 B	0 03	1192 B	0 04
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17571 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1159	1117 B	0 03	1196 B	0 04
17572 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1160	1117 B	0 03	1197 B	0 04
17573 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1161	1117 B	0 03	1198 B	0 04
17574 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1162	1117 B	0 03	1199 B	0 04
17575 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1163	1117 B	0 03	1200 B	0 04
17576 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1164	1117 B	0 03	1201 B	0 04
17577 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1165	1117 B	0 03	1202 B	0 04
17578 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1166	1117 B	0 03	1203 B	0 04
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17586 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1174	1117 B	0 03	1211 B	0 04
17587 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1175	1117 B	0 03	1212 B	0 04
17588 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1176	1117 B	0 03	1213 B	0 04
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17591 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1179	1117 B	0 03	1216 B	0 04
17592 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1180	1117 B	0 03	1217 B	0 04
17593 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1181	1117 B	0 03	1218 B	0 04
17594 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1182	1117 B	0 03	1219 B	0 04
17595 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1183	1117 B	0 03	1220 B	0 04
17596 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1184	1117 B	0 03	1221 B	0 04
17597 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1185	1117 B	0 03	1222 B	0 04
17598 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1186	1117 B	0 03	1223 B	0 04
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17602 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1190	1117 B	0 03	1227 B	0 04
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17636 THE MEXICO BOTS	DAVEY'S	SEA	CAP 1224	1117 B	0 03	1261 B	0 04
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# Bankers plot videotex futures at NYC conference

By John C. Dvorak, IW Staff

NEW YORK CITY, NY—War was declared inside the ballroom of the Grand Hyatt Hotel by a Minneapolis banker.

Discussing his bank's entry into the videotex arena, Stuart C. MacIntire, senior vice-president of First Bank System of Minneapolis, said, "We got into this business thinking of it as a new delivery system. It's not—it's a new business. Either we [the bankers] are going to control it, or it will control us."

These challenges were just part of the controversy that surrounded the Home Terminal Monitoring Service Invitational Conference held in New York City recently by the Reistad Corporation of Clearwater, Florida.

The meetings entailed two days of presentations attended by executives from IBM, AT&T, Citibank, E.F. Hutton and dozens of research firms developing plans to implement videotex services around the world.

"I try to make these conferences controversial," Dale Reistad told *InfoWorld*. "Things are hotly contested at first, then everything becomes fraternal."

Fraternalism notwithstanding, not everyone agreed on what was being said, and the sessions ended with more questions unanswered than answered.

While Stuart MacIntire emphasized total involvement and control by banking interests, saying that "the bank should be the total packager," others disagreed. During the lunch break another banker said flatly that MacIntire's words were "coming from a man who has spent \$2 million on this turkey and has nothing to show for it."

## A question of control

MacIntire emphasized that bankers had better heed his message, or they'll be left on the sidelines while their business is taken away. He specifically cited the importance of banks being in total control of electronic funds transfer (EFT) and videotex-based cash-management schemes.

Other speakers couldn't even agree on the potential market size. Jonathan Beachner, senior vice-president of the research firm Reynier & Gersin Associates, claimed that extensive testing showed a potential market penetration of 50% of all U.S. homes by 1990.

An AT&T executive who wished to remain anonymous told *InfoWorld* that AT&T research gave a figure of 7% penetration.

The theme of the conference was supposed to be on opportunities for partnerships in the videotex service industry. Everyone agreed that starting up a videotex service on a grandiose scale would be so expensive that it would be easier and wiser for several companies to share the cost burden. In the same vein, some felt that the potential losses were so great that it would also be nice to share a potential beating.

Two points that all the conference-goers agreed upon were that farmers and small businesses find videotex useful and that 300 baud is too slow. There was no agreement about how consumers would accept videotex and how much they would be willing

to spend.

Another controversy arose as to who would supply the cable for videotex to be transmitted over. Some, such as Kazie Metzger of Group W Cable, felt it would be the cable companies' job. Others, such as Group W's direct-sales force, as the key to getting it into the home. Others felt that the fragmentation of the cable companies would make it impossible for them to hook up the nation.

Finally, conference-goers accused the cable companies of being more interested in the aggressive "pay for play" approach to marketing their individual programming than in any-

thing that could be garnered from videotex income. (The "pay for play" concept uses two-way cable for the sole purpose of allowing a subscriber to see specific programming and charging him for it on a program-by-program basis instead of a monthly flat fee that is currently used. Critics expect the idea to become a bonanza for cable companies.)

The conference finished with the chairman of National Semiconductor, Peter Sprague, implying that until the U.S. has a national industrial policy, it will be difficult to get private industry to invest the kind of money necessary to make a go of videotex services. He

pointed out that the French government has given both financial and administrative backing to many French programs. He specifically cited the Télématique experiment, where 30,000 French citizens have been given a small terminal to replace their telephone books.

Sprague also mentioned a new French experiment, in which 3000 Apple computers in a southern French town "just to see what happens."

When asked about National Semiconductor's role in the videotex game, Sprague said his company was interested in selling chip sets only. ■

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# Will office automation spur industry to set standards?

By Deborah Wiese, IW Staff

**BOSTON, MA**—The microcomputer has secured a place in the office, but barriers still block its widespread use there, according to representatives from traditional office-automation companies and microcomputer manufacturers speaking at the Office Automation Forum here, sponsored by CW Communications.

"Office automation is coming up like thunder, but don't expect one paramount system," said Lewis Kornfeld, director of Tandy Corporation, manufacturer of Radio Shack computers. "Office automation is life threatening to a lot of hardware and software," he

added.

That is one reason why manufacturers of larger office systems have introduced microcomputers to fill out their product lines.

Representatives from Wang, Xerox and Digital Equipment Corporation spoke of integrating the microcomputer into today's office environment as a personal productivity tool and as a terminal for a networking system. "The microcomputer solves smaller problems for lower costs," said Art Laramée, office-products manager of DEC.

Because there are no industry standards for linking one computer's

microcomputer to other micros, minis or mainframes, however, integrating into an office that already has a larger computer system is difficult. The manufacturers were not optimistic that supportable standards would be developed soon.

"Perhaps when we have a benign dictator," suggested Robert Ruebel, senior vice president of Xerox's Office Products Division, "or when Bimbaum comes to Dunsinane," said Kornfeld cryptically.

"Users are going to drive up standards. It's not going to happen if it's left up to manufacturers," said Joy McCulley, office-market manager at Ap-

ple Computer. Adam Osborne, president of Osborne Computer, pointed out that "Everyone is for [a standard] as long as it happens to be theirs."

Standards and integration are possible only when manufacturers publish equipment specifications, but companies are wary of opening the door to increased competition if they do. Minicomputer and mainframe manufacturers want their customers to choose the microcomputers they make rather than create a network that includes other manufacturers' products. This policy, however, threatens the smaller computer companies.

Charles Miller, director of professional-support systems at Wang Laboratories, said that rather than "total compatibility, we should have information exchange."

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# On the PC bandwagon in Atlantic City

By John Unger Zussman

ATLANTIC CITY, NJ—In one of the least likely matches since Laurel and Hardy met Godzilla, the IBM Personal Computer and Miss America crossed paths in Atlantic City last month.

The occasion—for the PC, at least—was Personna's PC+1 convention, which was held September 8-11 at the Golden Nugget Hotel to commemorate the first birthday of the IBM Personal Computer.

Thirty-three exhibitors brought 56 PCs in the convention and displayed a variety of PC hardware, peripherals, system and application software, and support materials to about 2500 attendees. They joined such organizations as the Original Hobo Band and GeorgeAnn's Delaware Valley Finishing and Modeling Studio, all of which participated in the Miss America spectacle.

PC+1 provided a minor spectacle of its own, including a Charlie Chaplin movie, three "Chaplinettes," and a ribbon-cutting ceremony featuring Georgia Malick, a former Miss New Jersey. The social highlight of the convention was a PC birthday party at which Xedex Corporation held the first of three daily drawings for a PC Baby Blue memory/coprocessor board. The party was capped by a birthday cake decorated to resemble a PC.

The most conspicuous booth was IBM's, which was constructed of brightly colored panels—a break from the company's traditional blue and white. Although IBM simultaneously announced new communications and terminal-emulation software for the Personal Computer, it did not demonstrate these products at the show. Other vendors more than compensated, however (see follow-up articles in next week's *InfoWorld*).

Although attendance was smaller than expected, a significant number of Fortune 500 companies sent representatives. In addition, the exhibitors did substantial business exchanging information and showing their products to each other.

For example, IBM representatives approached several other exhibitors to inquire how contemplated changes in PC architecture would affect their products. This may be the first time IBM has ever informed independent, unaffiliated vendors of proposed product modifications in advance.

David J. Bradley, manager of system architecture for IBM, emphasized the company's determination to maintain the PC as an open system. "We must be responsive to the marketplace," he said, "and that includes making improvements in the system. But we want to impact these other people as little as possible. In publishing detailed specifications for the Personal Computer, we have limited our ability to modify it."

Several exhibitors incorporated their products into each other's systems during the show. For example, both Orchid Technology and Novell Data Systems demonstrated local networks of PCs using Baby Blue boards provided by Xedex. Other exhibitors exchanged products for examination, and future inclusion.

Microsoft, which markets the PC-

DOS operating system and a BASIC interpreter for the Personal Computer, announced a new software acquisition program called *IAV*—for *ISV* (Independent Software Vendor) Value Added Remarketing. The company plans to assist third-party software developers with user interfaces, ports, documentation, marketing and distribution. "By this time next year, we want to have a full catalog of software developed outside Microsoft, available for sale under the Microsoft brand name," said Alan Boyd, Microsoft's manager of product acquisition, at one of five PC+1 seminars.

Surprisingly, no manufacturers of

PC-compatible computers exhibited their wares at the show. "Several of them requested literature, but none decided to attend," said George Grafas of Atlantic Data Supply, which managed the convention for Personna. "We suspect that they were afraid they'd be trying to sell to people who'd already chosen IBM."

Unlike those of the Miss America pageant, the "winners" of PC+1 will not be determined immediately. The convention made it clear, however, that a major industry bandwagon has formed around the IBM Personal Computer. Although both exhibitors and attendees were disappointed that



George Grafas, Atlantic Data Supply; Georgia Malick, former Miss NJ; and H. Alton Neff, Personna president.

the convention was not larger, they recognized that it represented the beginning of the PC phenomenon and seemed uniformly excited about being part of it.

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Ron Jaenisch at the time he performed his first computerized wedding

## Portability comes to the Reverend Apple

By John Barry, IV Staff  
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Reverend Apple, Rev. 2.

The Reverend Apple will soon be in his third incarnation," according to his creator, Ron Jaenisch.

In case you haven't been following *InfoWorld's* exclusive, evolutionary saga of Reverend Apple, a little background is in order.

Rev. 0. Ron Jaenisch, an official in the Universal Life Church, starts using an Apple II to perform computerized weddings (*InfoWorld*, March 30, 1982).

Rev. 1. Jaenisch gives speech to the Reverend (*InfoWorld*, April 19, 1982).

Rev. 2. In about a month, according

to Jaenisch, certain ULC ministers will have "Portable Reverends," with which they can perform marriages over the telephone.

Instead of, or in addition to, a Bible, the ministers will carry a little black box that will enable them to perform ceremonies.

By using the Axlon Datalink (see related story, page 1), the ministers will be able to plug into a telephone and interact with the Reverend Apple.

Jaenisch says that, initially, his Apple will serve as the central computer for the marrying ministers. If the project expands, he plans to set up regional Reverends to handle the

increased load.

He also indicates that the Datalink-equipped ministers will be able to use the device for other purposes, by tying it into ULC computers.

Jaenisch says that nationwide interest in and demand for Reverend Apple's services spurred the idea for the Portable Reverend.

Jaenisch was already using an Axlon product, the RAMDISK, in his "second generation," talking Reverend. He then decided that the Datalink was the ideal vehicle to make the Reverend portable.

Jaenisch says he will "cut a deal with Axlon," which will also produce a necessary interface so that the Datalink can flash the ceremony onto remote TV screens. He plans to use commercially available software.

A recent event helped convince Jaenisch of the practicality of the Portable Reverend. At a ULC convention in Louisville, he lugged his Apple around with him, and was further convinced that he needed something smaller. He discussed the idea of ministers using the Datalink to perform weddings.

The idea was well received by the church, and Jaenisch plans to proceed with his project. "This gets us away from the image as the 'tax dodge' or 'draft dodge' church," says Jaenisch.

"In the 60s, we were known as 'draft dodge'; in the 70s, we were 'tax dodge.' Now we're known as the 'high-tech church.'"

Jaenisch, who has gained national notice, first through *InfoWorld*, then through network TV and popular magazines, says, "We'll make this a profitable venture."

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# T/Maker II offers apples and oranges

By John Markoff, *ITW Staff*

**PALO ALTO, CA—**Why doesn't anyone ever compare VisiCalc to WordStar?

If you think that this might prove to be an exercise in comparing apples and oranges, you should take a closer look at T/Maker II, a software program that offers many of the features of both electronic spreadsheets and word processors.

Designed by Peter Roizen, T/Maker was originally a simple way to build a table, or just add up five columns of figures.

Now poised to appear in its third version with expanded word-processing capabilities, T/Maker is moving close to becoming a first attempt at a "universal" program, applications software that can perform tasks as diverse as serving as a mailing-list generator, creating bar charts or sorting records.

Roizen has created a simple visual syntax in T/Maker, a way of representing and editing spreadsheet equations and text on the screen, and expanded it into a more general system. He thinks of it as something akin to an application-oriented version of the UNIX operating system, a system with a variety of different utilities.

Roizen believes that the power of T/Maker lies in its flexibility. "It's not a rigid system that locks you into things," he says. As if to emphasize this point, T/Maker presents you with a blank screen when you first enter the program, something that has proven disconcerting to some first-time users.

Creating tables on a T/Maker screen graphically demonstrates the advantages of the visual orientation that Roizen has built into the program. The particular equation for each table is not buried internally within the software, but instead is appended as a series of separate columns or a separate row or rows in the table, thus a user is able to see exactly what calculations are being performed by the model he has created.

"I try to do things visually as much as possible," he says. The way tabs are set in T/Maker exemplifies Roizen's philosophy—you create a sample line first and then tabs are set based on that line.

## Redefine commands

Evidence of T/Maker's flexibility is also noticeable on the quick-reference card that accompanies the program documentation. Editing commands in T/Maker are extensively definable, and the reference card has two command columns, one for the supplied keystrokes and another for "mine," so the user can easily redefine commands.

T/Maker also offers macro capabilities that allow users to link different functions. These macro command series can actually be stored in the file. Roizen, a mathematician who has worked for the World Health Organization and the World Bank as a programmer, began working on T/Maker I several years ago, before any of the Calc-type spreadsheets had begun appearing on the market. When VisiCalc first appeared he worried that all of his work had been futile. "I thought, God, I'm dead, and I didn't even look at Visi-

Calc, so at least I could say the idea was independently mine."

As it turned out, T/Maker and VisiCalc had taken different approaches to similar problems and Roizen's program has been selling well through its distributor, Lifeboat Associates.

Recently Roizen has decided not to renew a two-year exclusive distribution arrangement with Lifeboat Associates and is now actively looking for new distributors. To aid him in his new marketing venture he has enlisted the help of his family. His father Joe Roizen, who is president of Telegen, a teletext consulting firm, and sister Heidi are helping to develop

a new marketing plan for soon-to-be-released T/Maker III. His brother Ron, a sociologist at the University of California at Berkeley, is redacting T/Maker's documentation with novice users in mind.

Although only Peter and Heidi are skilled programmers, there are now six personal computers in the family, and Telegen uses T/Maker exclusively for all its business tasks.

Joe Roizen is obviously proud of his son. "We're going to offer it as a simple first program for your computer," he says, "and we're also going to tell people it may be the last program you'll ever need."



Joe Roizen watches his son Peter at work.

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## Crypto-code

continued from page 10

secure room in the conference-goers' dormitory. He brought up his program, entered the public key, pushed "run," and the Apple leaped into action. Adelman locked it into the room and went to bed.

The next morning Adelman unlocked the room, and there on the monitor glowed the Apple's solution to the secret key. He stored it on disk for use Wednesday morning when the cryptographers were scheduled to reassemble in the auditorium to evaluate the results of the contest. Not wanting to spoil anyone's fun, of course, Adelman kept his solution under wraps. This also meant, though, that

Adelman didn't know whether he was right.

Wednesday he kicked off the morning by giving a talk on his technique for deriving the secret keys from the public keys of the knapsack and its variants, such as Graham/Shamir. At the end of his lecture he used his Apple to call up its secret-key solution from disk.

The man from Bell Labs had already written down his secret decoding key on the bottom half of an overhead transparency and covered it with a sheet of paper. Adelman wrote his key on the top half. They then projected the transparency onto a screen in the auditorium and removed the piece of paper. The keys matched!

"I was lucky," says Adelman. "It

would have been a public humiliation," he admits, if his Apple hadn't come through.

Martin Hellman, the Stanford University electrical-engineering professor who first conceived of public-key encryption, then rose and gave what Adelman recalls as "a very gracious acknowledgment that my method works on the knapsack and its variants."

With the verification of the Adelman method, there remains only one public-key method, RSA, that hasn't been broken. Does this mean this promising field is shrinking to a close?

"There are probably other good public-key systems to be found," Adelman speculates. He admits that there are some reasons in principle why they are hard to come up with.

For one thing, "You'll never be able to get a mathematical proof that a system is secure," he says.

Adelman attributes the longevity of his RSA method to the fact that he "tied it to a problem with an awesome history of mathematicians trying without success to solve it"—a high-speed method of factoring numbers into primes. A prime number is one that is divisible only by 1 and itself. When a number has been factored down to its primes, it has been factored as far as it can go.

As Adelman and his colleagues who attended the Crypto '82 conference are vividly aware, however, there is no guarantee that efficient solutions to the factoring problem will forever elude mathematicians.

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# Olivetti releases software, announces plans for M20

By Paul Freiberger, *IW Staff*

Olivetti Corporation has announced several new software packages for its 16-bit personal computer.

Immediately available for the M20 system is an enhanced version of the Executive Secretary word processor developed by SofSys of Minneapolis. Executive Secretary Plus will run under Olivetti's PCOS operating system, developed for Italy's largest office-machine company by Microsoft and

that Zilog has an aggressive marketing campaign in the works hold out the possibility that the skeptics may be proven wrong.

"We've found that the Z8000 is a powerful workhorse," says Olivetti spokesman Howard Morgesen. "A lot of developers want to redesign their software or develop new programs for it."

Nevertheless, in order to make use of the growing software base for the IBM Personal Computer, Olivetti has announced that it will offer an optional 8086 board that will allow the machine to read IBM PC diskettes and run all software designed to run under

MS-DOS and CP/M 86. The add-in board is being developed by Tecmar of Cleveland, Ohio, and will be available in November for around \$600.

Users wishing to run CP/M programs today can purchase an emulator and CP/M program from Olivetti for \$300.

Olivetti is offering such EP/M programs as dBASE II, a popular database-management program from Ashton-Tate, and SuperCalc from Sorcim Corporation. A program generator known as Quick Code from Fox & Geller is also available for dBASE II. American Training Institution (ATI) of Manhattan Beach, California, has de-

veloped two tutorials for the M20—one to teach users about CP/M and the other to assist in using dBASE II.

At Olivetti's manufacturing facility in Ivrea, Italy, programmers are developing a word processor, OliWord, that is scheduled for release in November.

An 11-megabyte hard-disk system that will fit in the place of one of the mini-floppy drives will also be available in November.

The M20 is part of Olivetti's line of microcomputers. The M30 and M40 are multiuser systems that it currently sells only in Europe. Olivetti is considering offering these systems in the U.S. as well.



The Olivetti M20, a 16-bit microcomputer that has a swivel-base console display.

supplied with the hardware.

Other products available from Olivetti that will run under PCOS and utilize the M20's Z8000 microprocessor are Oliganti, a project-management program developed by Olivetti; Data Factory Plus, a data-base-management system from MicroLab in Chicago; and OliMaster, a computer-aided instruction (CAI) program.

When Olivetti announced its M20 microcomputer a few months ago, many industry insiders questioned its selection of Zilog's Z8000 microprocessor. The skeptics noted the overall popularity of Intel's 8086 and Motorola's 68000 microprocessors among companies that have announced or are developing 16-bit machines.

Olivetti has moved quickly in delivering its system and developing software for it, though. Rumors that Digital Research is planning an implementation of CP/M for the Z8000 and

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## High value of dollar hurts U.S. business abroad

By Paul Freiberger, IW Staff

The high value of the dollar abroad is good news for traveling Americans, but U.S. companies trying to do business in Europe don't necessarily agree.

The direct result of the high value of the dollar abroad is higher prices for exported American goods.

"There's little doubt that the currency exchange rates have had an effect," says Cromemco vice-president Roger Melen. "In '78 and '79, it [the exchange] was favorable to U.S. exports. The dollar was cheap and that was thought to be bad by the common American because it was expensive to

go to Europe on vacation. However, it was easier for them to buy our machines."

About one-third of Cromemco's business is done in Europe, where the company sells a large number of its System 3s.

"Prices have gone up 50% in Europe because of the exchange rate," adds Melen.

Microcomputer firms are hesitant to provide a breakdown of their business, but about 20% of the microcomputer industry's business is done in Europe. For some firms, international sales are even more important than that. Coupled with a depressed do-

mestic economy, the recession in Europe has slowed the growth of some U.S. microcomputer companies.

"We are waiting on the recession in Europe," explains Chuck Peddle, president of Sirius Systems. "We've put in a lot of distributors to penetrate that market. The buying power in Europe has been dramatically hurt."

Sirius manufactures the Sirius and the Victor 9000 microcomputers, identical computers that are packaged slightly differently. When the recession in Europe subsides, Peddle expects that business will be better for U.S. firms going after the European market.



■ Sirius makes the Victor 9000.

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# Digital Research and Microsoft court foreign favor

By Paul Freiberger, IW Staff

PACIFIC GROVE, CA—Digital Research and Microsoft are increasing their activities in Japan and Europe in an effort to promote their operating systems—CP/M and MS-DOS.

Both companies are striving to make their operating systems the international standard for 16-bit microcomputers.

A big challenge for Digital Research has been to gain acceptance among Japanese computer manufacturers.

Steve Maysonave, who is coordinating Digital's plans in Japan, explains that until recently microcomputer companies there used no standard software—"like [sic] in the early days here."

When IBM's plans for the Personal Computer with MS-DOS became known in Japanese boardrooms, though, the tendency of the Far East

**Both companies are striving to make their operating systems the 16-bit international standard.**

firms "was to do whatever IBM had done, and IBM hadn't announced CP/M-86 yet," according to Maysonave.

Maysonave believes this tendency has since changed and that Japanese companies will be offering CP/M as well as MS-DOS. NEC's decision to offer CP/M with its new Advanced Personal Computer has had "a major psychological impact" on Japanese companies. He said that Sony will offer CP/M on the 16-bit micro it plans to in-

roduce later this year. Surprisingly, Sony has not announced any plans to provide MS-DOS.

On the other hand, Microsoft spokesman Scott Oki believes that NEC, which offers CP/M-86, is emphasizing MS-DOS in much the same way that IBM is. "Most of the Japanese manufacturers are getting behind MS-DOS," he says.

Oki adds that Microsoft has contracts with several Japanese manufacturers that will be coming out with micros within the next year.

Digital Research's recent decisions to add graphic extensions to CP/M have also encouraged Japanese com-

panies because the use of the Kanji character set requires graphics capabilities.

There are three marketplaces for Japanese micros, according to Maysonave—Japan, the United States and Europe. Success in Europe, where local companies are not expected to be as technologically advanced as in Japan or the U.S., will depend on gaining acceptance by Japanese manufacturers.

In order to have access to European microcomputer users, both Digital Research and Microsoft have opened offices in Europe.

"Europe needs to have local techni-

cal support," explains Digital Research's chief operating officer, John Rowley. In order to provide this support, and in addition to the new offices and a European software director, Digital Research is translating all of its documentation into ten languages.

Microsoft has responded in a like manner. Oki explains that at COMDEX Europe, the first annual European conference and exposition for independent sales organizations scheduled for November 8 to 11 in Amsterdam, Microsoft will show products geared to local markets, including translated manuals and screen messages.

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## Service Calvados toasts Apple users with Harris link

By David Needle, IW Staff

The American College in Paris, France, is counting on at least 1,000 Apple users in that country to help the school pay for its Harris 500 super-minicomputer.

Qu'est-ce que c'est? you ask. The answer can be found in a unique project, worked out by the college and Apple Computer International, called Service Calvados. (Calvados is a French brandy made from apples.)

Service Calvados, which links French Apple users to the American College's Harris computer, began operating this summer and is France's first microcomputer network.

This service allows Apple owners to dial directly into the school's Harris computer from anywhere in France over Transpac, the French national X.25 packet-switching network (X.25 is a standard network protocol).

"Service Calvados is creating a revolution in commercial timesharing prices in France," according to Stephen Plummer, dean of students at American College. "What we are offering is one-third to one-fifth of the price of connecting to a traditional timesharing house," added Plummer.

The Apple users on Service Calvados have all the advantages of being able to connect to the Harris super-

mini, including access to such high-level languages as FORTRAN IV, FORTRAN 77, COBOL, BASIC, APL, C, Pascal and LISP.

The service is directed primarily at statisticians, financial analysts, engineers and other professionals, who comprise the majority of microcomputer users in France.

Hobbyists, however, are also expected to use the network. American College plans to establish special rates for microcomputer clubs, according to a spokesperson for Harris Computer Corp. who provided InfoWorld with a release about the project.

The timesharing program is a po-

litical boon to the American College, which is in a uniquely unfavorable position to receive government aid. It receives no support from the French government because it is an American institution, and it receives no support from the United States government because it's located on foreign soil. For similar reasons, it also receives few corporate donations or gifts.

Working under such economic constraints, Service Calvados has a goal of making computing services virtually free to the college by making the computer self-financing. This year, for example, 39,000 student terminal hours will be supplied at a cost to the college of under 45 cents per hour. Although this rate is inexpensive—one-fifth to one-tenth of the cost in U.S. schools—the college expects to be

**The goal of Service Calvados is to make computing services virtually free to the college by making the Harris self-financing.**

able to lower it significantly with the advent of Service Calvados.

Plummer said the college decided to support only one microcomputer—the Apple—because it would allow the college to provide more services.

"Others have made the mistake of trying for all the micros at once with the result that their functionality is severely limited," observed Plummer.

Eventually, the college plans to support other microprocessors. In addition to the Apple's, each running software "specifically designed to take full advantage of each micro's intelligence," added Plummer.

Contracts to connect to the service are sold through the 250 Apple retail outlets throughout France. The entry fee is approximately \$82 and includes documentation. A monthly fee of \$55 gives the user 500K of disk memory, 192K of virtual memory and access to many software packages. Hourly rates are \$5.50 during nonpeak hours and \$9 during peak periods.

Hardware requirements to connect to Service Calvados are an Apple II or Apple II Plus with 48K RAM, DOS 3.3, at least one disk drive, Applesoft, RS-232 interface board, modem and cable.

Although the present transmission speed is 30 characters per second, a rate of 120 characters per second is expected to be available by late 1982.

Other features planned include direct control by the Harris of Apple's graphics at the pixel level, bit-by-bit, which lets the H500 generate color graphic displays directly to the Apple's screen.

The Harris H500 can also automatically download software revisions. If the Apple's communications software is not up to date, the Harris computer can check it and automatically rewrite any revisions.

"This ensures consistency within the network" and prevents the need to redistribute diskettes as new software releases are developed, explained an official at the college.

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# Support and Service



*Charles Dilley of the GE Service Center in San Francisco gives an operational test to a newly repaired printed circuit board.*

Service and support is an unglamorous subject.

Observers like to discuss the riches made by microcomputer companies, the oddball or unusual application, strange personalities, fancy programs or even the technicalities of hardware design before they even want to broach the subject of service and support.

Questions concerning who is going to service the 15,000 old Processor Technology SOLs that are still in use don't get asked. Such questions might scare off a buyer of an IBM PC.

Since the early days of the SOLs and the Altairs, there have been a lot of changes. Big companies, such as TRW, are getting into the business of professional maintenance of microcomputers. Senior Editor Deborah Wise discusses the lucrative third-party maintenance market, and Senior Editor David Needle looks at the dynamic TRW.

Senior Editor John Markoff and Senior Writer Scott Mace used their researching skills to piece together an elaborate chart depicting the types of service microcomputer owners can expect to find,

and what they can expect to pay.

One fad in microcomputer service is the drop-in shop, and Senior Editor Mike Swaine talks about the General Electric approach to this fascinating business.

Over the years, we've seen improvements in hardware design, extensive use of sockets for plug-in circuits, standardization of the S-100 bus and new and better testing techniques. Eventually, we may even see the disposable computer, thus eliminating the need for service.

Software service and support, just like software itself, seems to be lagging behind the innovations and advances on the hardware side of the business. Is there anything new on the horizon?

Editor John C. Dvorak explores this question and uncovers the emerging idea of disposable companies. If one company goes out of business, another company can pick up where the first left off.

Service and support may not be glamorous, but you'll find that *InfoWorld* can make it interesting. ■



## General Electric offers 3rd-party support

By Michael Swaine, IW Staff

Everything put together sooner or later falls apart. —Paul Simon

When your ADDS Regent 25 terminal breaks down, do you take it to your neighborhood computer store or do you send it back to ADDS? If you happen to be a large-volume user of printed circuit-boards—including those found in terminals—you could send it to General Electric's new

Long Nguyen, a technician at the General Electric Service Center in San Francisco, repairs an ADDS terminal sent from outside the company.

printed circuit-board test and repair service.

GE has two such service sites—one in Atlanta and one in San Francisco, providing what the company describes as the only such service available from other than the [original] equipment manufacturer.

(We do not mean to single out ADDS terminals except as one of the types of products GE will repair, nor to suggest that they are particularly likely to break down. But as Paul Simon observes in his classic essay on computer support and service, "Paraphernalia," sooner or later everything does break down.)

The GE move may be part of a trend away from manufacturer-provided service and support for computers and computer equipment. In addition to the expected manufacturer- and dealer-service facilities, a number of independent service companies have sprung up or evolved over the past few years.

Some service companies, such as TRW, contract with the manufacturer to supply end-user support; Vector Graphic and Cromemco, for example, have turned over a large amount of support work to TRW. Others, such as Consultant Field Engineering in Shawnee Mission, Kansas, operate on a more independent basis.

GE's approach is different from these. The GE service centers repair equipment from a wide variety of manufacturers, but they restrict their service to customers who have a large number of identical boards—at least several hundred boards.

Typical customers for the GE service are telephone systems, airline ticketing networks and businesses with large networks.

### Branching out

GE is only dealing with large-volume customers because technicians at the service centers set up test software for each model of board to run automatic test equipment.

GE originally created the service for its own intracompany needs; GE is itself a major printed circuit-board user. A few months ago, the company opened the service up to outside customers. GE has developed "quite a few successful businesses where GE started doing it first for itself," said Alan Johnson of the GE News Bureau.

Now, the centers are serving both end users and original-equipment manufacturers and are doing repair work as well as product-line testing and diagnostics.

According to Anthony Mistretta, repair and calibration manager for the department of GE responsible for the new service, the service provides shorter response times and lower costs than repairs done by manufacturers.

Mistretta pointed out that geographical location is not a major factor in printed circuit-board repair since boards are small and light and can be safely shipped by air. He says the typical repair time for 100 boards is five days.

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# Nightmares haunt personal computerist's days

By John C. Dvorak

**Scenario #1:** You buy a software package. It runs fine for a few months—then all of a sudden it crashes, never to run again.

You call the vendor for a backup. The man who answers tells you that the company has been bought out and it has a new version of that package. He then says that the company no longer supports the old version and you have to spend \$500 for the new version.

**Scenario #2:** You have a software package and you're sick of the way it shows the data on the screen. You want to make some changes, but the program is compiled and you haven't got the source code.

When you call the company, you find that it is run by a weird 12-year-old genius. He says he'll send you the source code, but the program is written in GUB-FORTH, a version of the language FORTH that the young man developed when he was in the third grade. He never documented how the language works, and only he knows how to program in it.

**Scenario #3:** The program you have works fine, but your 8-year-old child found that by hitting the escape button, he could destroy the data disk. You can't figure out why this happens, and the hardware vendor assures you that it isn't the fault of the machine.

A call to the software vendor finds that the product was written by a gypsy. The software company just markets it; it doesn't know anything about how the program works or what it does.

**Scenario #4:** Your main program disk crashes. You go to the backup disk and find that you backed up the crashed disk. You scrounge through your library to find that the original disk has a gob of peanut butter smeared on it and was left out in the sun.

To your horror, you find that the software company is out of business and nobody knows what happened to the program.

These are just a few of the problems you may have to endure as a personal-computer owner. What do you do?

In the world of large computers and expensive packages, manufacturers take some extreme measures to ensure the end-user that the software will be supported and maintained.

Typically, companies that sell software for large systems expect the software to be maintained by a full-time in-house data programmer. The in-house programmer has to be competent enough to make his changes understandable and transferable to the next programmer who comes along. There is always the fear that the programmer will make his changes so that nobody else can ever run or understand the program. Some people think this is a route to job security.

Still, there has to be some support from the vendor—even if it is just training or technical advice. To make sure that this support is always available, some companies have gone to extreme lengths.

American Data Services of Portland, Oregon, a vendor of videotex software for banks, provides for 100% company

backup. That is to say, if ADS goes out of business another company will back up the software—in this case, a company called Applied Communications in Omaha, Nebraska. The effort is mutual.

"It's very reassuring for the customer," says Rick Smith, director of marketing for ADS. "We also offer a warranty period of one year for the software and will fly in support personnel if we have to."

Flying support personnel around the country isn't necessary for micro-computer software, but what about the idea of 100% company backup? What about a contingency plan to

make sure that the software gets support, even if the company has some future problems?

Simon Wiecezner, marketing manager for Boston-based BSO software, disagrees. He thinks that companies have "enough trouble if one of the programmers leaves."

Wiecezner thinks that corporate backup is an interesting concept, but says, "Software archiving may be a simpler and more practical approach."

With software archiving, a third party stores the documented source code in a secure location. It becomes available to the users if the company

goes broke.

Another problem in the fast-moving micro arena is trust.

"Who can you trust with your software?" asks Charles "Chip" Casanova, vice-president of Data Access, vendors of the DataFlex relational data-base manager. "Can you imagine Peachtree and MicroPro exchanging source codes? I can't imagine them talking to each other, and if they did, I'd question their motives."

He thinks the concept is good, though. He thinks it might work better with a well-equipped distributor, although there would be a security problem. ■

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## Micro boom fuels third-party maintenance market

By Deborah Wise, IW Staff

Microcomputer manufacturers can't service all the computers they sell. To fill this need, a market for third-party maintenance has grown up.

Today, the market is dominated by the computer-store chains that run back-room repair shops. In the future, larger companies will take over this role, as traditional electronics service centers take on personal computers, according to recent reports.

"We see large companies having more of an advantage over smaller shops in the third-party maintenance of personal computers because they are already into a number of different

maintenance areas. Small companies will have a tougher time," said Joan de Regt, author of a report on third-party computer maintenance put out by International Resource Development, a market-research firm in Norwalk, Connecticut.

### Easiest and cheapest

"Consumers and businesspeople will look for the easiest and cheapest servicing. Companies such as RCA or General Electric may make it convenient and cheap for people to come in with their personal computers," she added.

IRD's report, which is based on a

survey of miniframe, minicomputer and microcomputer users, predicts that, "fueled by the personal computer boom... the market for third-party maintenance of computer and data-communications equipment (which is now at the \$500 million level) will expand sixfold over the next ten years to about \$3 billion."

Companies such as General Electric and RCA currently provide walk-in and field maintenance for televisions, videocassette recorders and other electronic products. De Regt believes that "when the traditional service companies start to see the market [for personal computers] jump, they'll get

moving."

This move may help the corner computer store, even though it initially can take away from revenues derived from service. "If the dealer base is not sufficient to cover the user base, then the customers need alternative sources for service," said Bruce Tucker, technical-services manager of The Computer Factory, a store that has five locations in the New York City area.

### Convenient location

"We are positive about anything that makes more service available to the end user. We try to service our own customers as much as possible, but the existence of third-party service makes it easier," Tucker added. He felt location played a large part in a customer's decision to go back to the shop where he bought the computer or to contract a third party for service.

"We can't compete with a large organization like TRW that has a large inventory of parts, but if we are in a more convenient location, chances are the customer will come back to us," Tucker said.

When a businessman uses a microcomputer at work, he requires immediate service when the system breaks down. If the store he bought the machine from is on the next corner, he is more likely to go back to it for service.

"Bringing the personal computer out of the personal range and into the business market means customers demand a different type of service," said Charles E. Morgan, manager of customer service at Datel Stores of New York. Customers demand service quickly, which often means they go to the nearest store.

"We service our customers in the local area, but in the long run, I'm in favor of the deals like the one with RCA and Epson that gives customers of Epson products places to have them serviced wherever they go," said a manager of a Westchester County, New York, computer store.

### Specialization

Another problem that computer stores face is keeping a technical staff that can service up to five brands of computers. That's one reason why some dealers prefer to stick to one manufacturer. "At this point, we feel that if you specialize your expertise is that much higher," said Dorothy Cicchetti, president of Data Systems, the Zenith Data System's service center in the greater New York and New Jersey area.

Some stores that sell more makes of computers concentrate on specific parts of the computer and farm out peripherals, for example, to larger maintenance organizations. "We maintain the CPUs or the brands we carry and we let other organizations service the peripherals, such as printers," said Morgan at Datel.

In the long run, although larger third-party maintenance companies may take some of the business away from the local computer stores, they are more likely to support the local dealer and help service the volume sales that analysts predict over the next few years.

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# TRW service net helps clients maintain customers

By David Needle, IW Staff

With over 200 service outlets and 80,000 contracts, the Customer Service division of TRW is probably the largest, if not the busiest, third-party supplier of contract and service maintenance for computers in the United States. The company makes an estimated two million plus service calls a year on more than 700,000 individual pieces of equipment, ranging from calculators to computers.

TRW's list of clients has grown in the past few years to include microcomputer manufacturers such as Commodore International, Cromemco, NEC and TeleVideo. Company officials expect this trend to continue.

"Generally, service doesn't sell equipment; it maintains a customer," commented John Harnett, director of planning and development for TRW's Customer Service division. Maintaining customers is a high priority in the computer field, where new products come out virtually every day.

Harnett's duties include evaluating new client prospects and staying on top of the firm's current list of service contracts, which covers "everything from an IBM 370 on down."

The most common problems TRW encounters in servicing micros are not in the microprocessor itself, but in pe-

ripheral devices, chiefly printers and disk drives, according to Harnett.

"A printer becomes critical to a customer if he's relying on it to print his payroll. There are a number of brands we haven't picked up because they aren't reliable and we wouldn't be able to service them at a reasonable price," added Harnett.

Ironically, although the advent of computers has largely eliminated more mechanical means of computation and data processing, it is the mechanical components in systems that

## The most common problems are in the mechanical parts of printers and disk drives.

most frequently need servicing. Printers, because they are essentially open devices, are fair game for paper clips and other miscellaneous falling objects that frequently conspire to confound the continuity of computer output.

Another printer problem is wear. "The quality tends to drop off over a period of heavy usage," noted Harnett. A simple adjustment to the ribbon or

carriage, or the replacement of parts such as the print head and print wheels, usually solves the problem.

"Manufacturers are under tremendous pressure to produce cheaper peripherals and as a result, we're seeing an increasing failure rate," warned Harnett. His advice to consumers is not to buy the cheapest peripheral because "ultimately you get what you paid for."

Like printers, disk drives can also suffer from excessive use. The most common problem, according to Harnett, is defective diskettes. Another frequent repair is to the heads that read data off the diskettes. "Over a pe-

riod of time they often get out of alignment and need to be realigned," explained Harnett.

Prices for TRW service contracts vary from system to system. Generally, for a small system such as the Commodore 8032 with two disk drives, the service costs approximately \$350 a year. But if you include a letter-quality printer, the price goes up almost another \$300 (\$23 a month).

By the way, in case you've ever wondered what TRW stands for, the letters refer to last names of the firm's founders (who have long since departed from the scene)—Thompson, Ramo and Woolridge. ■

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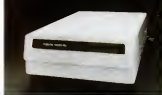
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## Warranty and support from micro makers

By Scott Mace  
and John Markoff, IW Staff  
How good is the service and support you get for your microcomputer? In an effort to find out what kind of warranty and service manufacturers are providing personal computer purchasers, InfoWorld has polled 14 different major manufacturers and asked them what their policies are.

The results provide an interesting commentary on the diverse marketing strategies that have developed in the

**'It's like having a Chevy. If something goes wrong, you take it to the dealer; you don't drive it to Detroit.'**

fiercely competitive microcomputer market. For example, Radio Shack stresses the fact that it is located close to its users while Texas Instruments, which doesn't have as much reach, has developed an exchange policy for its home computers. Other manufacturers, such as North Star, have gone to specialized third-party service organizations to handle support that is beyond their resources.

Most home-computer manufacturers are moving toward modularity, a concept perhaps first popularized by the Quasar "works in a drawer" television set of the last decade. Atari continues to perform wide-scale component repair in hopes of keeping down costs.

The move toward portability will change the nature of servicing, as business-computer owners find it easier to return the computer to the dealer.

The different strategies underscore what has become a critical ingredient for manufacturers who are seeking to convince a new wave of personal-computer buyers that their product will be there to hold their hands if something goes wrong.

We focused on the support that comes to the end user, not on less tangible but significant support programs that manufacturers give their dealer networks. Also, additional support that dealers provide users is difficult to catalog, but many such programs do exist. Finally, many small manufacturers of peripherals and other add-on products now offer warranties that may be as long as one year.

Below is a sampling of what we were told when we asked some of the different manufacturers what their service and warranty policies were:

**Radio Shack:** The Texas-based consumer-electronics giant has come close to becoming the "McDonald's" of the personal-computer industry. "Certainly it has as many retail outlets. According to marketing vice-president Ron Stegall, Radio Shack's strategy is to offer "face-to-face service" to virtu-

See Support, page 28



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# SUPPORT AND SERVICE COMPARISON CHART

COMPANY PRODUCT	WARRANTY	TURNAROUND TIME	SERVICE CONTRACT	SERVICE TRAINING	USER SUPPORT	FIELD SERVICE
Apple II and III	90 days Answering service	1 day	\$225/yr for II \$395/yr for III \$385/yr for Profile	4 days	Dealers plus	Major accounts
Commodore	90 days	Varies 2-3 weeks by mail	\$55 for VIC 20 or Max \$20-85 for peripherals	—	Cust. support team: (215) 687-4311	Up to dealer
Osborne	90 days	1 day	\$285/yr	1-hour videotape	Dealers plus Main number: (415) 887-8080	For OEMs
Zenith	90 days	Same day or overnight	10-18% of purchase price per year	1 week	Hardware: (616) 982-3309 Applications software: (616) 982-3860 Other software: (616) 982-3884 Factory customer service: (800) 447-4700 (In Illinois (800) 322-4400)	Standard with warranty or service contract
IBM PC	90 days	1-2 days	\$130-\$185/yr	Boca Raton	(800) 428-2569	Yes with service contract
Radio Shack Model II/III	90 days	2 days	12-20% of purchase price per year	2 weeks Fort Worth	(817) 390-2133	Yes with service contract
Digital Equipment Rainbow	90 days	—	\$24-\$34/month	Existing service centers	Yes	Yes with service contract
North Star	90 days	—	Sorbus	—	Dealers	Sorbus
Sinclair ZX 81	90 days	3-4 weeks	\$12/yr	—	No	No
Texas Instruments Home Computer	90 days	Exchange	N.A.	Factory repair	Yes	No
Atari 400 & 800	90 days	7-10 days	N.A.	3 days	Yes	No
Xerox 820	90 days	Varies	4 options available	1-3 weeks	If bought from Xerox	Yes with service contract



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<b>RECLAIM</b>	<b>SETSYS</b>	<b>SETRO</b>	<b>SETWR</b>
<b>DS</b>	<b>DISK</b>	<b>SAVE</b>	<b>LOG</b>
<b>READ</b>	<b>SPEED</b>	<b>READGR</b>	<b>LOAD</b>
<b>DUMP</b>	<b>WRITE</b>	<b>DUMPH</b>	<b>WRITEGR</b>
<b>MOVE</b>	<b>FILL</b>	<b>DUMPA</b>	<b>SEARCH</b>
<b>JP</b>	<b>EX</b>	<b>GO</b>	<b>USR1</b>
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## In Focus

### Support

*continued from page 26*

ally all of its customers. Radio Shack has now opened 330 computer centers and is opening new ones at the rate of 10 to 12 a month.

Radio Shack has two different extended-warranty programs, one of which is based on carry-in service and the other, called a "total maintenance" program, that offers on-site maintenance. According to Stegall, the company has a 14-day training school in Fort Worth that all Radio Shack technicians are required to attend.

**Texas Instruments:** Currently Texas Instruments is locked in a price-cutting battle at the bottom end of the home-computer market. TI handles servicing by asking customers to return computers that have problems to any of 50 regional centers where the computers are immediately exchanged for working machines. The faulty computers are then shipped to Lubbock, Texas, and repaired by TI technicians at the home-computer factory.

**Digital Equipment Corporation:** DEC is one of the new kids on the block in the personal-computer industry. The new kid in this case is also one of the big kids, and as a force in the minicomputer industry, DEC has some understanding of the key role that user support plays in marketing.

According to a spokesman, DEC now has plans for 160 service centers worldwide for its personal computer. The company already has 16,000 service and support technicians in 400 locations.

**IBM:** The company that is famous for its armies of white-shirted and black-tied service-repair personnel seems to be trying to make up its mind

on support in the personal-computer arena. IBM has now established a national repair and information center for the PC in Greencastle, Indiana, and is providing on-site and carry-in service through its Product Centers. One caveat to keep in mind with the IBM Personal Computer: if users add non-IBM equipment, such as memory boards or hard disks, that equipment must be removed before IBM will work on the PC.

**North Star:** North Star is an example of how smaller companies can get the same support reach as the giants without huge service organizations. The San Leandro, California, firm has contracted with Sorbus, a national third-party service organization, to provide user service and support. North Star manager of technical services Al Peterson stressed that North Star didn't have a technical-support hotline because the company simply doesn't have the resources to provide such support. He said that the company hoped to foster more professionalism among its dealers by forcing them to support the end user.

"It's like having a Chevy," Peterson said. "If something goes wrong with the carburetor, you take it to the dealer; you don't drive it back to Detroit."

**Sinclair:** The British mass-market is also approaching the problem of service by using an outside service bureau. Microsync in New Hampshire is handling service for the Sinclair ZX81 by mail.

**Commodore:** Like the Texas Instruments 99/4, the Commodore VIC 20 and Max machines and their attached peripherals under warranty can be exchanged over the counter at local dealers. If a dealer can't handle it, according to product-marketing man-

A technician carefully inspects and diagnoses a faulty printed circuit board.



ager Michael S. Tomczyk, owners can mail the defective machine to locations in Santa Clara, California, or King of Prussia, Pennsylvania. After the warranty has expired, each swap costs \$55 for the VIC 20 and \$20 to \$85 for some peripherals as disk drives and modems.

Larger machines, such as the 64, PET, CBM, P and B series, must be taken to a full-line Commodore dealer, typically a computer store, for warranty service. Commodore recommends that its dealers provide a loaner machine when they cannot repair it on the premises.

Tomczyk says service technicians' "biggest bugaboo is finding out what went wrong. Is it a software problem or a hardware problem? The bottom line is it's difficult to tell over the telephone."

**Apple:** Lucrative national accounts with large corporations caused Apple to hire RCA Data Services to handle customers who need fast, on-site service. Most Apple owners will continue to take their machines to one of 1400 Apple dealers for servicing. The goal is a one-day turnaround, according to Dick Baumann, Apple's service-marketing manager. Some repairs take less time, such as disk-drive calibrations, which can be performed on the spot.

The extended-warranty charges listed in the chart include all Apple-produced items attached to the CPU except for soon-to-be-released letter-quality and dot-matrix printers and the Profile hard disk for the Apple III, all of which have separate warranties.

Technicians spend a week learning to repair Apples and perhaps a week extra to learn about Profile repair, said Donna Dubinsky, customer-support-program manager.

Apple owns a second level of service centers specifically to help dealers; however, end users who need to call one of the six U.S. Level II centers, Baumann said.

**Zenith:** Perhaps the most elaborate service and support comes from Zenith Data Systems. For example, on-site servicing is a standard part of Zenith computer warranties. Subsequent service contracts are based on a percentage of purchase price, according to Zenith marketing manager Andrew Czernek.

"Turnaround time is the same day if the call comes in in the morning. Extensive user hotlines broken down by hardware and kinds of software are available (see chart: "other" software includes operating systems, languages and utilities).

Czernek said service became important about a year and a half ago, and he, like many others we contacted, believes service is one of the pivotal conditions to selling micros to large companies. "Right now it's one of the weaker links in the microcomputer industry," he said.

Servicing is performed by a Zenith-controlled network of third-party companies. Zenith is known for its strong service reputation in the television-manufacturing industry.

**Osborne:** On-site servicing is virtually nonexistent for the Osborne I, and national-service manager Fred Oswick attributes that to the Osborne's portability. The Osborne is highly modular, and since technicians don't

have to work at the component level, training for module replacement and diagnostics is performed by videotape, Oswick said.

The one-year extended warranty won't cover some peripherals, such as a battery pack or modem supplied by but not manufactured by Osborne.

Oswick said Osborne will look for and supply third-party servicing for OEMs that request it. Quality control is another important factor at Osborne. The recent decision to hold back a double-density version of the Osborne I was a result of such concern.

Xerox: Dealers have the option to sell Xerox service or sell their own servicing for the 820 and 820-II. The Xerox service is tiered, including many options previously discussed.

In order of descending cost, service contracts available are: on-site maintenance; pickup/delivery; and pickup/delivery with loaner machine and carry-in service. Xerox spokeswoman Liz Mooradian couldn't explain why taking a loaner machine was more expensive than not taking one. Like all other manufacturers, one-shot service is also available for the cost of time and materials.

Xerox operates more than 70 service centers in the U.S. Customers have access to a Xerox hotline only if they buy directly from Xerox; otherwise, they must depend on the dealer network. Atari: Though Atari was unavailable for comment on its service policies, one dealer did note that Atari prefers to do as little swapping out as possible.

Steve Switzer, owner of Electronic Fantasy in San Mateo, California, runs three authorized Atari service centers in the Bay Area. Switzer said Atari wants its dealers to service machines at the component level. Centers that do too much swapping out are subject to losing their authorization.

"Atari wants to go through very few boards," Switzer said. Special authorization from Atari is also required for centers to be able to repair disk drives.

Atari does have an extensive network of service centers. Switzer praised Atari for backing up the dealers with support. He added that the customer hotline provided by Atari is of limited value and is sometimes used by customers who want to avoid paying installation charges. ■

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## Editorial

### Overworked phobia over work

Phobias—we all have a few. For some, these inexplicable and illogical fears are paralyzing; for others, the phobias are a nuisance and an annoyance. Computerphobia, one of the more recent phobias on the lengthy list of fears we live with, cannot be classed with the phobias that threaten physical harm, such as the fear of flying; it falls into that more nebulous group of psychological fears.

We've heard about some of the fears that constitute computerphobia. One of the major concerns of any businessman buying a computer is that the computer will sit in the corner unused, collecting dust. This is a legitimate fear. Many companies, duped into spending precious resources on computers, have seen the equipment end up in the storeroom. Businessmen also fear the spiraling costs of computer software—especially software that never seems to quite do the job. If it is custom software, businesses are at the mercy of a programmer who may be the only person in the world who can explain and operate the software the company has now become dependent upon. This circumstance only increases anxiety about computers. Service is another tangible fear. If the system crashes, so might the company!

Tangible fears can usually be countered by rational discussion and planning. What about the emotional, less tangible aspects of computerphobia? Fear of the unknown is one part of the computerphobia, but the fear of computers is much more complex than that.

The extent of the fear depends on how much the user interacts with the equipment. For example, some clerical workers who are forced to use computers or word processors suspect that the electronic intrusions will eventually take away their jobs. Assembly-line and manufacturing personnel have similar concerns. Sadly, this is a valid concern. Computer technology is changing the structure of the work force by automating many jobs.

The executive confronted with computer technology has a different kind of fear, a hidden fear that no one admits readily, which is based on productivity. The advent of the personal work station poses a new problem for the white-collar worker—increasing work loads. Say the company can spend  $X$  amount of dollars to give you a tool to do more work. In the past, you'd get another secretary; today, you get a computer, and so you can do the work yourself. No more sitting around reading the *Wall Street Journal* until noon; the president wants five different spreadsheet analyses of your output!

Historically, we have been a hard-working lot, but over the past several decades, white-collar workers have gotten more and more leisure time. Leisure time, however, may well become work time for the thousands who buy personal computers for both the home and office. Suddenly, not only do you put in a 40-hour week at the office; you then come home to this computer that stares you in the face and beckons you to do more work during what used to be time to watch TV or to relax.

Thus, this hidden fear is unusual and not easily countered. To many people, computers represent an endless stream of work. Computers usurp time that we need to think and to relax. It will be interesting to see if psychologists find themselves with patients complaining about depression from the pressure of being able to do an infinite amount of work.—MC

## Letters to the Editor

### Beautiful coverage of documentation

The coverage of the documentation vacuum (August 30) was beautiful. Keep it up. I have been an electronics technical writer for over 30 years, and it has been a source of constant frustration to see how ignorant computer hardware and software merchants are of the potential for good writing.

I bought my Apple II Plus over two years ago and spent six months wading through the available literature to find what I needed to know to write my own programs. Using commercial programs, and having to spend days finding out how to work them, was another big turn-off.

I figured that a good book on introductory programming for the Apple would sell itself, so I wrote one. Apple agreed to look at it, and that's as far as it went. I had to coax dealers into carrying it, and I so gave up trying to peddle my own book. Readers wrote to say how much they liked it, and begged for more. It is called *Polishing Your Apple* and will soon be published by Howard W. Sams and Co.

If the war on bad documentation is to be won by anyone, it will be won by the professional tech writer. This letter is to encourage others to take the initiative and produce their own good books. There is money to make and new worlds to conquer.

Herb Honig  
Englewood, NJ

### Bravo on Iwo cover

Bravo on your July 19 "Iwo" cover.

The flak you encountered seems silly. I passed the cover around at Hughes Aircraft and everyone saw the humorous intent, replying with comments like "yesterday's enemy, today's friend." That kind of satire is always refreshing. In that it can remind us that fierce competition carried to this extreme has tragic and farcical qualities.

Jose L. Sanchez  
Sr. Engineering Designer  
Hughes Aircraft  
Garden Grove, CA

### U.S. and Japan

Please send a copy of the "Iwo Jima" cover suitable for framing and bill me. Your inspired graphic points out much that is troubling and contradictory with world trade relationships in the 80s.

I believe it was Alexander Hamilton who said, "The spirit of commerce softens the manners of men and extinguishes those flaming passions which have so often kindled into war." (1787)

It seems that lately U.S. humors regarding the Japanese have all been choleric. This has something to do with stolen chip secrets; steel dumping; auto-import quotas ignored; and riots in Tokyo against free U.S. submarine protection of their island. This list is only partial.

Perhaps on the anniversary of your "Iwo Jima" cover you can depict the same scene but with a Bataan Death Bus, loaded with Japanese executives roaring up from behind to replace their American counterparts. This illustration should infuriate all your loyal readers regardless of race, color, creed or national origin—especially if it depicts the truth.

R.P. Cummins  
Missoula, MT

### Jazzy programs for retarded teenagers?

I am looking for a jazzy, patient, interactive program to help teach reading and typing to a retarded teenager. His fastest, most eager learning experience so far has been playing games on the Apple II. Vocal ability in the program would be a bonus.

From information available in your pages (especially the September 6th issue), I suspect that such programs are being written, but the distribution system is not set up for individuals to find out about them, much less acquire them.

Margaret Holton  
4511 138th Ave. NE  
Seattle, WA

### What about Xerox?

Why no news about the Xerox 820?

In your June 14, issue, you reviewed the 820 hardware that uses 8-inch disks. How about a review of the 5¼-inch model?

In July, Xerox announced a new model, the 820-II, which upgraded the 820. Several weekly publications reported the news, as well as the daily *Wall Street Journal*. To my surprise, I have not found any further updates about this new model in *InfoWorld*.

If I've overlooked them, shame on me; if you haven't researched the significance of the new model and reviewed it, shame on you.

In the world of Apple, PC and Radio Shack, surely there must be some room and interest left for reporting major news of other micros.

Herbert Kandel  
New Orleans, LA

### IBM keyboard controversy

In Paul Freiberger's article on the IBM PC keyboard, he makes a number of statements about potential problems that make me wonder just how many computer or electronic keyboards he has used.

As an owner of an IBM PC for five months now, as a writer and programmer experienced with a number of different electronic and mechanical keyboards, and as a typewriter technician with more than seven years of repair experience, I could not disagree with him more.





Freiberger starts off with a series of complaints about the placement of certain keys. Granted, the choice of locations requires some adjustment for those of us trained on conventional typewriters or some terminal and computer keyboards; however, despite references to standard keyboards made by many reviewers of this keyboard, a "standard" keyboard, on typewriters or I/O devices, does not exist.

Practically every brand of typewriter, terminal and small computer has a different layout. The difference may be only one or two keys, but that requires adjustment if you are used to another layout.

As for his statement about the Caps Lock key being too easily struck instead of the right shift key, I have tried to duplicate the problem and come to one of two conclusions. Mr. Freiberger either has an exceptionally flexible right pinkie, or his typing desk is too high. I personally have a little trouble hitting the Caps Lock key even when I want to, much less accidentally when trying for the shift key.

Apparently, Mr. Freiberger is not pleased by the symbols on the tab, shift and return keys he forgot to mention the backspace key. Actually, I find such symbols a vast improvement over the RETURN/ENTER debate and the BACK/DELETE dilemma that has plagued keyboards for years. The symbols are intuitive and unambiguous, two qualities sadly lacking on other products I could mention.

Finally, Mr. Freiberger believes that the clicking of the keys is too loud. Maybe so. I know for a fact that IBM has spent a great deal of time and money over the last several years researching the ergonomics and human-engineering features of keyboards; and on at least one, maybe two, occasions scrapped prototype keyboards because they did not meet IBM's stringent requirements.

The clicking sound on its PC keyboard, though perhaps too loud for some people's taste, is directly linked to the switching action of the key. That means you know you have entered a character at precisely the moment you hear the click. Too many times, I have encountered keyboards whose audible keystroke indicator was unreliable and not precisely in time with the keystroke. Few problems can be as distracting.

This leads me to what I consider to be the IBM PC keyboard's most salient feature, one that Mr. Freiberger completely and unconsciously ignores if his intent is to provide an informative review and not just take cheap shots at a big target. Of all the keyboards I have

encountered, including the IBM Selectric II, the IBM PC keyboard has the best overall tactile feel. And that is the single most important feature of a keyboard if you intend to do extended touch typing without hand fatigue.

I challenge Mr. Freiberger to name a keyboard product that can exceed or even match the excellence of IBM PC keyboard.

James M. Austin  
Austin, TX

The place remains that IBM's design placed several keys (most notably the shift and return) in uncomfortable positions. You mentioned the answer to your challenge: IBM should have stuck with the layout of its excellent Selectric keyboard.—Paul Freiberger

## 1K hurrahs for IW issue covering documentation

A thousand hurrahs for your August 30 issue on the documentation debate.

As a user of both dedicated word processors and microcomputer systems, my pet peeve has always been the "dearth" of proper documentation, as you quote Diana Patterson, of SIGDOC, lamenting. It amazes me how vendors continue to market excellent wares with uncomprehending, incomprehensible and—yes!—uninteresting hard copy. It is a pleasure and a relief that you echo my thoughts, and that of many other writers I know. If we all deplore this state of affairs loudly enough, the vendors cannot help but hear us and take stronger action.

Barbara Elman  
Hollywood, CA

## One-hand keyboard

Re: One-hand keyboard *InfoWorld*, August 16. In 1945, Commander August Dvorak developed simplified one-hand typewriter keyboards for the left hand and right hand. The article, "A One-hand Keyboard for One-handers," is available for \$08 (85¢ California residents), from: Quick Strokes, Box 643, West Sacramento, California 95691.

An individual using his method achieved a net typing speed of 54 words per minute in only ten weeks. How about combining his alpha arrangement with an expanded numeric keypad? You could use such a data-entry device for invoices, to take notes from a book, for remote control of videotext and so on.

Chuck Trier  
Spokane, WA

Viewpoints or letters to the editor are welcome.

Please print or type double-spaced  
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## Viewpoint

# Microless school days=fool days

By Philip E. Stowe

The Committee on Basic Skills Education, formed to protest the use of computers in classrooms (see *InfoWorld*, May 10 and August 9, 1982), would be great fun to join. I'm sure it must give terrific parties and is much like its sister organizations, the Society for Creative Anachronism and the Flat Earth Society—poking good clean fun, tongue firmly in cheek.

I can see the letters already: "Our concern is for the children," they'll say; "we're serious"; and "how blind can I be?" Their concern is for the educational quality of the schools. These committee members want the schools to do their job better by improving teaching staff and methods. They firmly believe all of those things, and they'll work very hard to make the schools better, the methods better and themselves better.

In the end, of course, the schools will fail. It isn't a failure of the schools per se that has created our crisis of dropouts and functionally illiterate graduates. The school systems, in fact, are the perfect vehicle for doing the task they were designed to do. We can hardly blame the schools if we, and our concerned friends on the committee, have come to hold unrealistic expectations of the schools.

The task of the schools, and of the "system," is "enculturation," not teaching. We often confuse the two. Teaching and teachers are but two facets of the system that prepares great numbers of people for productive roles in a culture that uses them in large numbers to do indistinguishable work with scheduled regularity. This system, the industrial system, is inexorably becoming obsolete with the advent of the computer.

Our school systems are, therefore, extremely good at preparing our children for careers that are rapidly disappearing and that may not even exist in a few years.

We need good teachers more than ever now. The need for teachers, and their relative importance in our culture, grows constantly as we shift to an information handling, decentralized service economy.

It isn't the computer in the school system that the committee needs to be concerned about, it's the school system itself.

The committee deems the general-purpose microcomputer inadequate for giving pupils basic educational skills. I suppose the committee has in mind the average student, in the average classroom, preparing for the average life. The people who serve on the committee, no doubt, seek highly customized tools to prepare the homogenized products of the system for a world wherein the only ubiquity will be the tool with which their graduates perform highly individualized tasks. They would, if I understand them correctly, remove general computer instruction from the schools and replace it with specialized micros and languages used nowhere else. That's a bit like granting a diploma to a student without requiring him to know how to read and write a complete sentence in English and using Cuneiform A and clay tablets in the classroom.

It is too bad, really, that our friends on the committee haven't been able to see past the typewriter-style keyboard or the television-style screen. They would discover the microcomputer to be the most highly customizable, modifiable device for teaching ever conceived by the human mind [except the mind itself, of course—but sometimes I even question that exception when I hear pronouncements like the ones the committee makes].

While I was writing this I recalled how (a very short time ago, it seems to me at age 41), my fourth-grade teacher, a person who greatly challenged me and made me think, punished and chastised me in front of my classmates for a most heinous crime. I had had the effrontery to submit my homework written with one of the new ball-point pens. Maybe that says it all.

## Random Access/John Unger Zussman

### LAIDBACK with (a) FIFTH

BASIC, FORTRAN, COBOL...these programming languages are well known and (more or less) well loved throughout the computer industry. There are numerous other languages, however, that are less well known yet still have ardent devotees. In fact, these little-known languages generally have the most fanatic admirers. For those who wish to know more about these obscure languages—and why they are obscure—I present the following catalog.

● **SIMPLE**—SIMPLE is an acronym for Sheer Idiocy's Monopurpose Program-

ming Linguistic Environment. This language, developed at the Hanover College for Technological Misfits, was designed to make it impossible to write code with errors in it. The statements are, therefore, confined to BEGIN, END and STOP. No matter how you arrange the statements, you can't make a syntax error.

Programs written in SIMPLE do nothing useful, thus, they achieve the results of programs written in other languages without the tedious, frustrating process of testing and debugging.

● **SLOBOL**—SLOBOL is best known for the speed, or lack of it, of its compiler. Although many compilers allow you to take a coffee break while they compile, SLOBOL compilers allow you to travel to Bolivia to pick the coffee. Forty-three programmers are known to have died of boredom sitting at their terminals while waiting for a SLOBOL program to compile. Weary SLOBOL programmers often turn to a related (but infinitely faster) language, COCAINE.

● **VALGOL**—with special thanks to Dan and Betsy "Moon Unit" Pfau!—From its modest beginnings in Southern California's San Fernando Valley, VALGOL is enjoying a dramatic surge of popularity across the industry. VALGOL commands include RE-

ALLY, LIKE, WELL, and Y'KNOW. Variables are assigned with the = LIKE and =TOTALLY operators. Other operators include the "California Booleans," FERSURE and NOWAY. Repetitions of code are handled in FOR-SURE loops. Here is a sample VALGOL program:

```
14 LIKE, Y'KNOW (I MEAN) START
% IF
PI A=LIKE BITCHEN AND
01 B=LIKE TUBULAR AND
9 C=LIKE GBODY"MAX
4K (FERSURE)"2
18 THEN
41 FOR I=LIKE 1 TO OH MAYBE 100
86 DO WAY + (IDITTY"OH
9 BARFI=TOTALLY GROSS(OUT)
-17 SURE
1F LIKE BAG THIS PROGRAM
? REALLY
55 LIKE TOTALLY Y'KNOW
```

VALGOL is characterized by its unfriendly error messages. For example, when the user makes a syntax error, the interpreter displays the message, GAG ME WITH A SPOON!

● **LAIDBACK**—Historically, VALGOL is a derivative of LAIDBACK, which was developed at the (now defunct) Marin County Center for Tai Chi, Mellowness and Computer Programming, as an alternative to the more intense atmosphere in nearby Silicon Valley.

The center was ideal for programmers who liked to soak in hot tubs while they worked. Unfortunately, few programmers could survive there for long, since the center outlawed pizza and RC Cola in favor of bean curd and Perrier.

Many mourn the demise of LAIDBACK because of its reputation as a gentle and nonthreatening language. For example, LAIDBACK responded to syntax errors with the message, SORRY MAN, I CAN'T DEAL BEHIND THAT.

● **SARTRE**—Named after the late existential philosopher, SARTRE is an extremely unstructured language. Statements in SARTRE have no purpose; they just are. Thus, SARTRE programs are left to define their own functions. SARTRE programmers tend to be boring and depressed and are no fun at parties.

● **FIFTH**—FIFTH is a precision mathematical language in which the data types refer to quantity. The data types range from CC, QUINCE, SHOT and JIGGER to FIFTH (being the name of the language), LITER, MAGNUM and BLOTTO. Commands refer to ingredients such as CHARLIS, CHARDONNAY, CABERNET, GIN, VERMOUTH, VODKA, SCOTCH and WHATEVERAROUND.

The many versions of the FIFTH language reflect the sophistication and fix-

See Random Access, page 33

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"You took that problem out to infinity, didn't you."

## Software for People/Paul Heckel

## Prototype, rewrite and revise

*Paul Heckel's specialty is writing user-oriented software. This week, he discusses the need for testing software on potential users and then rewriting it again and again until the user finds the software easy to use.*

*The two most important tools an architect has are the eraser in the drawing room and the sledge hammer on the construction site.*

—Frank Lloyd Wright

*Writing and rewriting are the constant search for what one is saying.*

—John Updike

*An artist never really finishes his work; he merely abandons it.*

—Paul Valéry

Most software is "unfriendly" because programmers don't test it in actual use. Often, we test the program only to remove bugs, not to determine its ease of use. Too frequently, we publish our first drafts.

Sometimes software managers blame poor planning or design when a program is difficult to use. The implication seems to be that next time the planning and design will be better and the program will be easier to use. This is partially true: we all learn from experience. Planning and design alone are not enough to make programs friendly, though. The real problem is that we do a poor job of visualizing the end product in actual use.

The textbook way to develop a computer program is a three-step process: design, code, debug. As soon as you finish one part, you begin the next. With this method the basic design is

## Random Access

*continued from preceding page*

financial status of its users. Commands in the ELITE dialect include VSOP and LAFITE, while commands in the GUTTER dialect include HOOTCH and RIPLE. The latter is a favorite of frustrated FORTH programmers who end up using this language.

● **C**—This language was named for the grade received by its creator when he submitted it as a class project in a graduate programming class. C is best described as a "low-level" programming language. In fact, the language generally requires more C-statements than machine-code statements to execute a given task. In this respect, it is very similar to COBOL.

● **LITHP**—This otherwise unremarkable language is distinguished by the absence of an "S" in its character set. Programmers and users must substitute "TH." LITHP is said to be useful in prothething lithith.

● **DOGO**—Developed at the Massachusetts Institute of Obedience Training, DOGO heralds a new era of computer-literate pets. DOGO commands include SIT, STAY, HEEL and ROLL OVER. An innovative feature of DOGO is "puppy graphics," a small cocker spaniel that occasionally leaves a deposit as he travels across the screen.

determined early, and changes are minor. It works well for software projects where there are proven product specifications, such as compilers for existing languages.

This is not the way a good communicator works, however. A good communicator makes an initial draft and then begins to revise and rewrite. Hemingway, for example, rewrote the ending of *Farwell to Arms* 39 times. He had trouble "getting the words right." James Michener has protested that he is not a great writer, but he "is one of the world's great rewriters."

Filmmaking consists of constant revision. The scriptwriter spends months writing and rewriting a film script before it is acceptable. Even when the script is ready, Neil Simon, for instance, brings the actors together to read the script. "Why," he says, "should I wait until the very first day of rehearsal to find out I'm going to be in trouble?" With *Goodbye Girl*, Simon brought the actors together for readings three times before he was satisfied—*all* after the script was supposedly finished. Neil Simon said that if he had started shooting with the original script, he could not have saved the film because he did "a month's rewriting before shooting began."

Shooting begins; but rewriting con-

tinues. Rewriting continues on the set as the director and cast discover problems. The several takes of a shot are also "rewrites"; the director strives for exactly what he wants. After shooting ends, editing begins, which generally takes six more months.

Robert Towne, who fixed the problems in the scripts of several fine films (most notably *The Godfather*), explains the reason for so much revision:

*You are always miscalculating in a movie, partially because of the disparity between what you see on the set and what you see on the screen. No matter how skilled you are in anticipating what the image is going to look like finally, you can still be fooled. So you have to rewrite, and be rewritten—not be*

See *Prototype*, page 34

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## Prototype

*continued from preceding page*  
cause the original is necessarily badly written, but because ultimately if it doesn't work for a film it is bad.

In other arts, revision is the rule. Beethoven's draft manuscripts survive today, and from them we know that those great, simple, wonderful melodies were the result of many revisions. Picasso is known as a painter who could paint one or two pictures a day, but his best and most powerful painting, *Guernica*, was the result of several months of constant revision.

Anyone who accepts the premises that (1) designing user-oriented software is a communications art and (2) we can learn from the experiences

of other artists, must recognize that only by constantly revising our programs will we be able to make them easy to use. We cannot expect success the first or second time. If our application is going to be all innovative, we can't even expect to get it right the third or fourth time.

Once we recognize that prototyping [sic] and revision are crucial to user-oriented software, we can plan for it.

I like to sketch out a working prototype and then, in response to various people's reactions, continuously upgrade it into a finished, polished product. This focuses my attention on the user's problems. Since these problems form the seeds from which my creative ideas grow, my users are the beneficiaries.

If I don't test my program on other people early in its development, the structure of the program becomes set and any but detail changes are hard to make. Furthermore, the ego investment involved in my having spent considerable time and effort bringing something to fruition blinds me to shortcomings and possible improvements.

By getting the program working early in the project, I find I have less ego investment in my ideas, and this can let go of them more easily. Any good artist gets emotionally involved in his work, but he must also be able to step back and view his work rationally. He must, in William Faulkner's phrase, "be willing to kill his babies." If we don't plan for revision, we don't get to

look at our babies until they are adults and we no longer control whether they live or die.

You can also use a prototype to sell a product concept to management or to potential users. The prototype provides a common data base for those involved in a project. Many product-development projects resemble the proverbial elephant that six blind men look at—each senses things differently. A good prototype, like a movie story-board, can reduce misunderstandings and focus attention on the real problems and opportunities.

My company prototyped the Craig Language Translator. We wrote the production translator on a single-chip computer that had little ROM and less RAM, but we prototyped the translator using a high-level language on a completely different CPU—an 8085 with plenty of ROM and RAM. Ideally, the prototype software should have run on the final hardware so that we could experience what the user would experience.

### ***Crucial ones***

The prototype, however, freed us from petty problems and allowed us to concentrate on the crucial ones. We could make a rough draft of the program and do major revisions on it easily. We had the first version working in about five weeks, and a good enough working version to begin production coding in ten weeks, although we spent almost five months revising the user interface. Here are some of the benefits we got from prototyping the translator:

- We came up with several major improvements over the original specification. Many of these affected the fundamental design, but since they showed up in the rough-draft stage, the changes were not costly. We came up with the search feature for misspelled words in this stage. The search feature was not just a frill; it became a major constraint on the data-structure design.
- We postponed major design decisions until quite late in the project. We replaced the rudimentary data structure, which worked fine for prototyping purposes, with the production data structure later in the project. We postponed details of this decision. In fact, until two weeks before we cut ROM. If we had made design decisions earlier, the translator would have been less capable.
- We extensively revised and refined the user interface.

All this work paid off. Even if it was a high-technology "pet rock," the Craig translator proved to be the easiest to use and best selling of the translators in the marketplace. ■



"I wondered what that button was for."

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**Computer Illiteracy/John Barry****Go for the juggler: good bad stuff**

In the August 30 issue, I raised the possibility of "computer literacy" contributing to functional illiteracy (although in the coming computer age, perhaps literacy as we now know it will be a symptom of functional illiteracy).

Since then, so much good bad stuff has come my way that I'm going to have to postpone exploration of the effects of computers on literacy.

This installment starts with a reprint for yours truly. In the August 2 issue, I chastised *InfoWorld's* typesetting equipment because it didn't "know" how to hyphenate words correctly. The problem of mishyphenation by computers is pervasive, and I listed a few bad word breaks, couched in the form of people's names—Franci-scans, for example—that I saw in a column in a local paper.

Then, an *InfoWorld* reader called to say that she was "tearing out her hair" because she couldn't figure out who "the German Uns Smiling" was.

She had a good reason to be perplexed: the "name" should have been Uns Miling.

Since then, our typesetting machines have been working overtime. Here's a partial list of their latest creations: da-res, asy-nchrouous, bat-ches, resu-mes, wri-tes, tha-you, fra-mes, misunde-rstandng, slideshow, whe-reas, conti-nued, mainta-ning, correc-ted, any-one.

Hit the F-key, for "flunk" in hyphenation generation.

Now on to some of that great bad stuff I mentioned earlier.

Let's try that random-word generator again. "I advise potential buyers to find out which hardware their version will support prior to purchase, since no documentation is provided to enable the individual programmer to interface a unique environment. If your hardware is included in the installation program's menu, your system can be up and running in minutes."

Yeah, there's a housing shortage, but this is ridiculous. "The company has also moved into factory-assembled microcomputers."

Let me in, beep-beep. "Incorrect input will not be accepted, and a beep signals that you must reenter."

If we don't wish that spreadsheet pretty soon, he's going to get up and walk away. "A spreadsheet does more than just use the metaphor of the spreadsheet; he communicates a model of the spreadsheet."

Round gears are more effective. "We geared squarely at the desktop market."

Banking is so staid. "Don't expect the program's reports to live with your bank statements."

Shoot the piano player; stab the sailing baroque. "Other companies are going for the juggler in terms of price competition and the struggle to carve

out a market share."

**The kid was framed:** "The student must be set up in front of an Apple."

**Plug-inconveniences:** "There are other inconveniences attached to this system."

**Do you know that the human body is over 75% water, Mandrake—and that the personal computer is only 5% hobbyist?** "About 25% of the company's computer customers are hobbyists, in his

opinion, compared to the personal computer overall of which hobbyists make up only 5%."

**Now there's an incentive to be computer literate!** In his book *The Information Society*, Yoneji Masuda proposes a "Computer Peace Corps," one component of which is an "Uneducated People Eradication Team."

**Early days, old standards.** "CP/M is an artifact from the early days of microcomputing, which became a de facto operating-system standard by default."

**Computer-sales literacy.** "Company officials say the direct-sell approach appeals to people who may

have thought about buying a computer, but have found computer jargon and the blatant ignorance of computers of department-store personnel intimidating."

**Al Kahn may have been a lousy economist**, but he was right on the mark when he deplored indiscriminate use of one of the words in the following sentence. Do you know which one? "The company has stated that they [sic] are in the process of implementing a newsletter to registered owners of their [sic] products."

**Ridiculous acronym.** Not really an acronym, it's so silly I couldn't pass it up: CSMA/CD (carrier-sensing multiple-access/collision detection). ■

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## ZenCalc, spreadsheet for Heath/Zenith computers

By Roger Feinema

If you think ZenCalc is an Eastern religion's answer to the Reverend Apple, you are in for a surprise. The Zen is derived from Zenith, while the Calc suffix, as popularly used, designates a member of the electronic-spreadsheet family.

The purpose of a spreadsheet is to represent related numbers with formulas in a matrix format. When you change one or more numbers, any other numbers in the matrix affected by this change are recomputed quickly and automatically.

Each row and column in the matrix is labeled. ZenCalc labels its columns

with letters, first lowercase and then uppercase, and the rows with numbers. Both are in reverse video. The intersections of the rows and columns provide the coordinates for each position in the grid. Of course, only a small portion of the grid can appear on your screen at any one time. ZenCalc displays 7 columns of 11 characters, and 23 rows.

Although the capacity of a spreadsheet may be large (ZenCalc has 32 columns and 255 rows), the number of positions you can fill depends on the memory of your computer and, to some extent, the operating system you use. With ZenCalc, 500 positions are

the maximum you can expect to fill with a 48K system.

I was able to fill only about 300 positions because of my extensive use of formulas, which use more memory. ZenCalc claims to have up to 1500 positions available for systems running under CP/M with 64K.

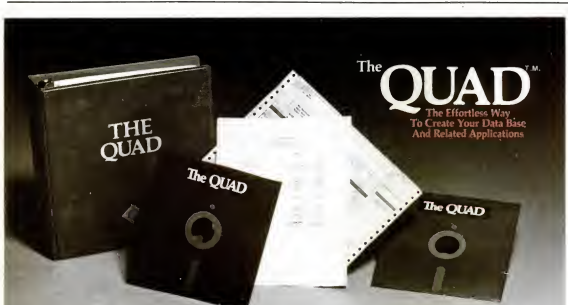
ZenCalc is written for Heath/Zenith computers running under HDOS or CP/M, and retails at a reasonable \$99.95. It is available on 5 1/4-inch or 8-inch disks. Version 1.1 was released in March of this year, and this version (2.0) was released in May.

**FEATURES:** You enter data into ZenCalc by positioning the cursor

block, which is the full width of a column, essentially as you would with a full-screen editor. As you move the cursor to the far right or bottom of the screen, the cursor retains its position, but the window moves. If you are at position g7 and try to move the cursor to the right, the columns all move left, leaving you at h1.

The five function keys give you a means of going directly to a specific column and row, or of taking screen-size steps to the left, right, up, or down. Pressing an arrow key and the shift key moves the cursor to your last entry in the direction of the arrow. Touching the HOME key gets you back to the a1 position.

In the lower right corner, on the "25th line," is a "free space" counter indicating available memory, plus the cursor-position coordinates. These



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- spaces between printing of forms

### SAMPLE REPORT

DATE	DESCRIPTION	AMOUNT	BALANCE
1/1/80	OPENING BALANCE	100.00	100.00
2/1/80	PAYROLL	50.00	50.00
3/1/80	RENT	25.00	25.00
4/1/80	UTILITIES	15.00	10.00
5/1/80	SALES	75.00	85.00
6/1/80	EXPENSES	30.00	55.00
7/1/80	INCOME TAX	10.00	45.00
8/1/80	DIVIDENDS	20.00	65.00
9/1/80	INTEREST	10.00	75.00
10/1/80	SALES TAX	5.00	80.00
11/1/80	RENTAL	15.00	65.00
12/1/80	SALES	40.00	105.00
TOTAL			105.00

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- update as many as 10 or more files simultaneously, using the batch update mode
- locally use defined screens
- record sizes up to 800 characters
- perform calculations based on data entered and data reading in other files
- access three different help screens during the data entry process
- utilize your terminal's video capabilities when creating your terminal update screens

- restrict all or some data fields from future changes
- edit each data field for items such as phone numbers, numeric data, alpha-numeric data, date, time, social security number, etc., or your own defined edits
- IF-THEN* logic available during both terminal and batch updating

### SAMPLE SCREEN

DATE	DESCRIPTION	AMOUNT	BALANCE
1/1/80	OPENING BALANCE	100.00	100.00
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3/1/80	RENT	25.00	25.00
4/1/80	UTILITIES	15.00	10.00
5/1/80	SALES	75.00	85.00
6/1/80	EXPENSES	30.00	55.00
7/1/80	INCOME TAX	10.00	45.00
8/1/80	DIVIDENDS	20.00	65.00
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### OTHER FEATURES

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## InfoWorld Software Report Card

### ZenCalc 2.0

	Poor	Fair	Good	Excellent
Performance	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Documentation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Ease of Use	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Error Handling	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

### System Requirements

- Heath/Zenith H-89, Z-89 or Z-90 computer or H-19 or Z-19 terminal
- HDOS or CP/M
- 48K RAM (more recommended)
- One 5 1/4-inch or 8-inch (CP/M only) drive

Price: \$99.95

### The Software Tools

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are both in reverse video. When you run low on or out of memory, a *Low/Out* message appears next to the coordinates.

For ZenCalc's most frequent operations, you use single-stroke cursor-movement and command keys. For some commands, however, you must press the "prefix" key, ENTER, followed by a command key. This allows you to enter a range of positions, for example, before initiating the actual command. You must also use it before relatively infrequent operations such as line and column deletes, disk reads and writes and changes in column width and update frequency.

ZenCalc also has keys to let you "pick" data or a formula from one spot and "put" it at another, or at a range of positions. When you use functions such as Insert and Delete, all references these functions affect are automatically changed.

ZenCalc saves your spreadsheet in a data file when you exit from the pro-



gram. You can also print a file or save it to disk in the spreadsheet format displayed on the screen. You can edit either file with any text editor.

If your spreadsheet is wider than the capacity of your printer (ZenCalc prompts you for page width in columns), it will print in segments. Then you can piece it together to get the whole picture. You also have the option of printing any rectangle of your choice from the spreadsheet.

You can read files from ZenCalc on startup, load them as subroutines or read overlays (such as the tax return template that comes with ZenCalc).

If you intend to use a spreadsheet for your tax returns, Appendix B and the tax files should give you a good start. They are specifically designed for 1981, but you can edit them for other years.

ZenCalc also includes an on-line HELP facility you can access with one keystroke to assist you until you've memorized all the commands and operations.

**PERFORMANCE:** Following a suggestion in the documentation, I wrote-protected the distribution disk, copied it to an initialized disk and was under way in less than five minutes. Section 1.2 of the documentation, "Getting Started," gives clear, albeit brief, instructions for both HDOS and CP/M.

I followed the tutorial (Chapter 2 of the documentation), and in less than an hour I was creating my own spreadsheet.

ZenCalc has three types of data entries: label, number and formula. The first key you press determines which of the three types your entry is. Your entry is labeled and displayed at the bottom left of the screen, and entered at the cursor position as soon as you press return or any cursor-motion key. The explanation to this procedure is when you enter a formula, in which case its value is printed at the cursor position. You have the option of displaying (and printing) the actual formulas instead of their values, however.

ZenCalc normally displays numbers to the nearest hundredth, although you can change this. The numbers are calculated accurately to 13 decimal places. You can enter numbers in scientific notation, as long as the exponent doesn't exceed an absolute value of 38. In fact, the program can automatically convert your numbers to this notation if they exceed the allocated column width (zero to 77, your choice), or if they would be zero when rounded to two decimal places. Numbers are always right-justified in the columns.

You can also display numbers graphically as a horizontal bar (printed as asterisks).

Labels, or titles, are generated any time you press a key other than =, \*, or a number. These generally move off the screen if you exceed 7 columns or 23 lines, but ZenCalc gives you the option of retaining them, although you can't print when you're in this mode.

You always begin formula entries by typing an equal sign. Any algebraic expression is acceptable. ZenCalc also provides 16 functions that you can use in your expressions. Your formula can reference any other spreadsheet entries, regardless of their positions, and you can edit existing formulas without

having to retype them.

Updating, the recalculation of all the spreadsheet values, occurs automatically whenever you change a number or formula. I found the speed of this process to be quite acceptable, except when I was making multiple entries while creating a new spreadsheet. ZenCalc lets you disable this feature when you don't want it, though.

**EASE OF USE:** Even if you have never used a "Calc" program, you shouldn't have any problems learning the basics of this one. If you are familiar with PIE, The Toolworks' text editor, you'll have an advantage, since ZenCalc uses many of the same key sequences.

Since you use the keypad extensively for cursor (entry) block move-

ment, you must have some facility with it. (If you don't, get a good video game; it's the fastest and most painless training method.)

The aforementioned HELP feature contributes to making this program easy for you to use. If you forget which command produces what function, you need only press the question mark and the screen will display what you need to know.

I found the commands and operations to be logical and therefore quite easy to remember and use. If you are a novice with little or no mathematical aptitude, though, you will probably not get the maximum use from ZenCalc without thorough study of the documentation, and quite a bit of practice.

**ERROR HANDLING:** Although I made several errors while familiarizing myself with the program, there were none from which I could not recover immediately and easily. You can't, of course, enter numbers from the keypad, because it is in the cursor-control mode, but you can recover from this kind of mistake by simply reentering the data. If you do try to do something impossible—like move the cursor off the top of the screen—the "bell" sounds. In addition, for many other errors, you receive an explanation at the bottom of the screen. Backspacing, or repeated backspacing, immediately gets you out of most errors.

**DOCUMENTATION:** The documentation is excellent. See *ZenCalc*, page 41

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## Amper-Magic, Applesoft & machine-language utility

By Alan Suding

Amper-Magic is a combined Applesoft and machine-language utility that adds machine-language routines to your Applesoft program. The programmer does not need to know machine language or Applesoft internals. Twenty-three routines are included. **FEATURES:** Applesoft BASIC interprets an ampersand (&) as a call to a specific memory location. A programmer-written, machine-language subroutine at this location is then executed. Typically the routine would interpret the rest of the line. Therefore, you can write extensions to Applesoft BASIC. You must have knowledge of

machine language, obviously, as well as the internal structure of Applesoft.

Amper-Magic eliminates this need. Amper-Magic allows you to add subroutines previously saved on disk (or you can edit them directly from the keyboard, if you're brave). Amper-Magic fiddles with the Applesoft internal pointers and tucks the routines at the end of your program safe and sound. Your Applesoft program can be edited and listed as if the routines weren't there.

Applesoft programs saved on disk will keep these routines so that you can run your program without having to reload the routines.

**PERFORMANCE:** Twenty-three routines are included with Amper-Magic. These routines can delete an array so it can be redimensioned, do string printing (not PRINT USING), make it easier to poke values into memory, and speed up Applesoft execution by changing the beginning of the program pointer.

Probably not all of the routines will be useful to everybody. There are five or six I will never use, such as hex memory dump, disassemble memory and move memory.

A menu-driven program loads the subroutines into your program. The easy-to-use program lets you add mul-

tiples routines, delete routines and change their names. You name the routines as they are loaded. You can use their suggested names or make up your own. You can't name the routines anything you want, but the program is flexible enough to make them readable.

These routines can be executed in the immediate mode after they are loaded and a program containing them is run once.

An Applesoft program with these routines can be edited with the ACE and PLE program editors. Amper-Magic is compatible with some of the program optimizers on the market.

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## InfoWorld Software Report Card

### Amper-Magic

	Poor	Fair	Good	Excellent
Performance	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Documentation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Ease of Use	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Error Handling	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### System Requirements

- Apple II with Applesoft in ROM or Language Card
- DOS 3.3
- 48K RAM
- One disk drive

Price: \$75

Anthro-digital  
103 Bartlett Avenue  
Pittsfield, MA 01201

(These were not specifically identified in the documentation.) Amper-Magic is not compatible with Applesoft compilers.

Machine-language routines are faster than the equivalent Applesoft statements. Frankly, though, most of my speed problems are with disk speed or iterating through a loop several hundred times. These routines can help you at times, but don't expect lightning increases in speed.

**EASE OF USE:** A few minutes of use and I was loading routines into my Applesoft programs. You load your program from disk or type it in. Then you execute the Amper-Magic program. The menu of this program flows in the logical order in which you use the functions. The menus are clear: Most of my guesses worked when I was too lazy to check the documentation.

You should be an experienced Applesoft programmer to use this package. Some of the routines won't mean anything to you unless you have used Applesoft awhile to recognize what these routines add. Machine-language familiarity is recommended if you want to add routines from magazines.

**ERROR HANDLING:** The subroutines  
See Amper-Magic, page 41

## ZenCalc

continued from page 39

tation consists of 56 pages of 8½-by-11-inch paper. Although it's not typeset, it is quite readable.

The documentation is well structured and generally understandable. The first two pages list the table of contents, and the last three contain an excellent index. A five-page appendix summarizes ZenCalc's commands, and a short (two-page) appendix tells you how to calculate your income tax with ZenCalc.

The text itself is in eight chapters, and the sections of each chapter are numbered in a 1.1, 1.2 fashion, with some sections further broken down into subsections such as 6.7.1. Chapter 1, an introduction, tells you what the program is all about. Chapter 2 is a tutorial and is all you really need to read to get started. The following chapters specialize, going into more detail on some of the points in Chapter 2. By using the table of contents and the index, I was able to find everything quickly.

I did find some flaws, none of which were serious. There is a minor error in the text on page 11, where a formula is misstated ("=b1" should have been "=b2").

There are a couple of inaccuracies. You are told that the messages "Low Memory" and "Out of Memory" will be printed under those respective conditions. In reality, you get "Low" and "Out!" The statement that an exponent in scientific notation "must be between -38 and +38" is wrong. Actually it's between plus and minus 39, since 38 is a valid exponent.

A sin of omission is the lack of any description of the memory counter, or "free space" counter (sometimes spelled "freespace") until you get to page 44, by which time even the most obtuse of us have already figured out what it is. Although it's alluded to in Chapter 3, I feel we deserve an earlier explanation of something this important. Also, redundancies such as "RAM memory" mar the professionalism of the manuscript.

One thing that might bother you is that all pages are labeled ZenCalc 1.1, except a manual-supplement sheet labeled ZenCalc 2.0, inserted between pages 2 and 3 of the 1.1 manual. Since it is also numbered as page 2, it seems a little out of place.

The supplement page describes several improvements, changes and enhancements, but it made little sense to me until I had gone through the documentation a couple of times.

**SUPPORT:** Included in my ZenCalc package was an 8½-by-11-inch information sheet, at the bottom of which was a software-registration form. Apparently you are expected to complete it and return it to The Software Toolworks (at your own expense). It is brief but asks for comments, suggestions and requests. The company lists a telephone number, but I discovered that it is not answered at all times of the day.

The documentation dogmatically states that purchasing this software "conveys a license for its use on a single computer, owned or operated by the purchaser."

**SUMMARY:** ZenCalc does everything its makers claim it does, and it does it as described. ■

## Amper-Magic

continued from preceding page  
time-loading program checks for sufficient buffer space to load routines. It validates the name you assign a routine by the rules described in the documentation. The menus respond well to erroneous inputs.

I did manage to hang the system; I had to use a power off and on to get out of the problem. I deleted a table, then tried to load another one when there wasn't sufficient buffer space. If you press the reset key, the system will crash, requiring a power off. Neither of these situations is mentioned in the manual.

The manual does warn that you must always exit the Amper-Magic

program through the given menu exit. If you try to exit any other way, your program is destroyed and must be loaded again. Some of the loadable routines also contain warnings about their use and the fact that you need an original copy of your program.

**DOCUMENTATION:** The manual is about 50 pages. There is an overview of Amper-Magic and descriptions of the utility options that gradually lead you into its use. The required hardware and software is listed.

The manual follows the menu order. What you see on the screen is most reproduced in the manual.

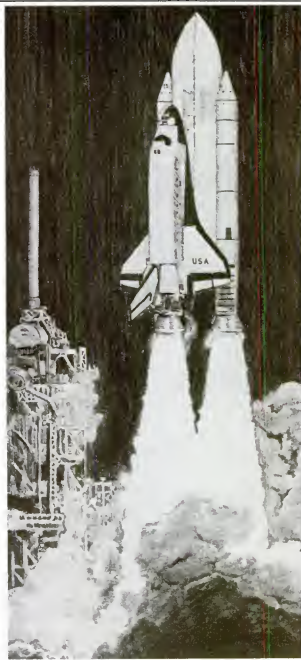
The style of writing is clear and to the point.

The documentation identifies which memory locations are used and

which are not. It discusses the requirements for subroutines you may wish to use from magazines or code yourself. Blank forms are included for documenting additional routines.

**SUPPORT:** The disk is copy-protected. Anthro-digital provides a 90-day warranty on the disk. After that period, you'll have to send in \$7.50 and the original disk to obtain a replacement.

**SUMMARY:** Amper-Magic worked as advertised. Anthro-digital intends to bring out additional routines to load with Amper-Magic. It seems a little overpriced, considering the number of useful routines I would use. On the other hand, it easily incorporates machine-language routines with AppleSoft. ■



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## SMAL-LDOS, OEM form of LDOS for TRS-80s I & III

By Tim Danelluk

SMAL-LDOS is an OEM (original-equipment manufacturer) version of the LDOS operating system for the TRS-80 Models I and III. It is intended for both software authors and hardware manufacturers as a mass-distribution DOS for their new products.

**FEATURES:** SMAL-LDOS is a subset of the full LDOS operating system. As such, it retains the command syntax and overall design concept of the original LDOS 5.1 product. The command library of the system has been pruned down for SMAL-LDOS, which reduces the amount of diskette space required

for the system. Specifically, the following commands from LDOS 5.1 are not found in SMAL-LDOS: LINK, RESET, ROUTE, BOOT, BUILD, CREATE, DEBUG, DUMP, FREE, PURGE, TRACE and SPOOL. The SYSTEM command is present in SMAL-LDOS, but with fewer options than the original version.

The obvious question is, "Why use a stripped-down DOS when a full-featured version is available? The answer is "space." A normal LDOS system occupies about 58K of disk space. This leaves about 25K of room for programs on a single-density 35-track Model I disk. SMAL-LDOS needs only 36K of space, however. This

leaves the software author plenty of room for applications programs as well as a distribution DOS.

SMAL-LDOS also comes with a selection of utility programs. BACKUP is essentially the same as in LDOS 5.1. You can choose to back up an entire disk, or choose files to copy by filename, by file extension, by date of file creation, whether a file is old or new to the destination disk and whether a file has been modified since it was last copied. You can also use wild-card characters to ignore or select certain characters in the filename when you use BACKUP.

The FORMAT utility is also identical

to the LDOS 5.1 version. It prepares new disks to receive data. As before, you can select the density, track count, number of sides, stepping rate and so on.

CONV is a utility that allows you to read files from Model III TRSDOS diskettes and move them to an LDOS diskette.

**HITAPE,** for the Model III user, allows 1500-baud cassette operation under SMAL-LDOS when using BASIC.

Another important utility is **REPAIR.** The LDOS family of products uses a special DAM (Data Address Mark) on diskettes in order to make all LDOS-formatted diskettes readable on either

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## InfoWorld

Software Report Card

### SMAL-LDOS Version 5.1.3

	Poor	Fair	Good	Excellent
Performance	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Documentation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Ease of Use	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Error Handling	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

### System Requirements

- TRS-80 Model I or III
- One or more disk drives

### Logical Systems

11520 North Port Washington Road  
Mequon, WI 53092

the Model I or III. Although this makes the diskettes portable between the different machines, it also makes standard Model I TRSDOS diskettes unreadable. You use **REPAIR** to change a disk from TRSDOS format to LDOS format. If you use a Model I with a standard Radio Shack expansion interface, you can also use **REPAIR** to convert an LDOS diskette back to TRSDOS format.

SMAL-LDOS also comes with several special driver programs. **PDU&L** and **RDU&L** are disk drivers for use with the Percom and Radio Shack double-density conversion kits for the TRS-80 Model I. With these drivers and the appropriate hardware, a Model I can write double-density diskettes that are readable on the Model III.

The system also comes with **KI/DVR**, a new keyboard driver. This driver debounces the keyboard, adds type-ahead and key-repeat functions and provides a screen-to-printer dump from a single keyboard command.

**PR/FLT** is a printer "filter," which allows you to set such things as height and width of a printout, left-margin width and whether to send a line feed after a carriage return. This program is useful when you want to adapt a particular program for use with several different types of printers.

A complete disk BASIC, called **LIBA-**

# MiniMicroMart, Inc.

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SIC, comes with SMAL-LDOS. It has all the features of the original Tandy Disk BASIC, plus many more. LBASIC can execute DOS commands from BASIC; extend existing sequential files; do an in-memory machine-language sort for arrays; and produce variable-length logical-record random files.

Finally, although SMAL-LDOS provides a DO command, it is not as flexible as the job-control language found in the larger systems. The DO found in SMAL-LDOS is primarily intended for simple batch-type processing, and, therefore, does not have the run-time and compile-time macros that LDOS has.

**PERFORMANCE:** SMAL-LDOS, clearly a descendant of the LDOS family, runs smoothly and as the manual predicts.

The only surprise I encountered was when I selected the blinking cursor option. Whenever I rapidly hit the space bar, the cursor (an underline character) would appear randomly on the screen. This never caused any system failure or error, so I dismissed it as an oddity rather than a problem.

Generally, the choice of which commands to include is difficult when designing an OEM version of a high-performance DOS like LDOS. For the most part, the choices made in SMAL-LDOS were good.

In several places, however, I wished Logical Systems had made a different decision. First of all, one of the greatest strengths of LDOS is that it is a truly device-independent system. SMAL-LDOS does not implement the LINK

and ROUTE commands that exploit this feature, however.

Another area of weakness is that the SYSTEM command has no provision for customizing the DOS for various disk drives (i.e., the driver command DRIVE=). This makes it difficult to use SMAL-LDOS with 8-inch floppy disks or hard-disk systems. I was able to access both of these types of drives if I first configured a standard LDOS system, and then transferred it to a SMAL-LDOS system via the command SYSGEN. This is dangerous, however, since the two LDOS products are internally different, and this procedure could cause unpredictable errors.

In my judgment, some infrequently used commands—such as TIME, DATE and CLOCK—could have been

eliminated in favor of the more useful device and disk commands above.

**EASE OF USE:** One of the hallmarks of the LDOS family is ease of use. SMAL-LDOS is no different. The command syntax is easy to learn and self explanatory. As with any advanced DOS product, you need time to become familiar with the nuances of the system. This is a user-oriented product, however, and most people will have minimal difficulty learning and using SMAL-LDOS.

**ERROR HANDLING:** SMAL-LDOS uses the usual TRSDOS/LDOS-type error messages. These detail the nature of the error, what (if any) drive or device is involved and where in memory the error occurred. There is also a complete family of LBASIC error mes-

sages. The error messages are meaningful and complete.

**DOCUMENTATION:** LDOS was virtually the first DOS to be thoroughly documented. SMAL-LDOS, also thoroughly documented, comes with a manual that is over 150 pages long. Every detail of the system is clearly described in a simple, readable style. There is no technical documentation, however. Presumably, this is because SMAL-LDOS is intended as a distribution DOS rather than as a development system.

**SUMMARY:** This is an excellent by-product of what is probably the premier TRS-80 operating system. No doubt, many software vendors will accept SMAL-LDOS as their primary distribution DOS.

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## Computer Power, a first course in using a computer

By Denise and Doug Green

It's no secret that the popularity of Pascal is growing faster than Pinocchio's nose. Pascal can be a good language for beginning students of programming at the secondary level. In 1984, in fact, the Educational Testing Service will begin using Pascal for its Advanced Placement examination in computer science.

Computer Power is a software package based on Pascal, designed for teachers who want a complete curriculum. Teachers who have little computer experience can use this package as they can learn along with their students.

**FEATURES:** Computer Power is an introductory programming curriculum for junior-high, high-school and junior-college students. It uses Rascal, which is a cartoon-animation dialect of Pascal, and an INTERPAS interpreter, which helps students to understand their programs by simplifying the error messages and by using the immediate-execution mode.

One computer for each class of 15 students allows adequate computer time for each student. The hardware requirements are quite specific: an Apple II computer with 48K of memory, a Pascal Language System or a 16K language card, one or two disk drives,

game paddles and a color TV or monitor. You must also install a special keychip and keycable, which comes with the software, in order for the program to run.

The entire package includes seven diskettes, a teacher's handbook and a student textbook. Teachers can also get the Rascal and INTERPAS reference manuals as resources, but you don't need them for the course.

An errata file and an INTERPAS and Rascal error-message file, on a disk entitled Teacher, are important reference tools.

Rascal, based on UCSD Pascal, has a menu of choices for all operations,

such as executing and editing programs. Because Rascal was developed for beginning programmers, some of its features make the language easier to learn. In the immediate mode, students can type in programs and then execute them right away.

Rascal contains high-level graphics commands as well as the standard Pascal commands. Rascal has a utility for making shapes and animation, called the Maker and Painter programs. A Help file gives the commands that you need to know, and a Filer function lists disk directories or removes files to make space for other files.

# The verdict is in.

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### InfoWorld

Software Report Card

#### Computer Power

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Performance	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Documentation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ease of Use	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Error Handling	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

#### System Requirements

- Apple II or II Plus
- DOS 3.3, Apple Pascal Version 1.1 and Pascal keychip
- 48K RAM
- 16K RAM Card or Apple Language Card
- One disk drive
- Color monitor; game paddles

Price: \$385 (Teacher's manual and Rascal/INTERPAS interpreter)  
\$7.50 (Student text)

Gentware Corporation  
Box 8301, University Station  
Knoxville, TN 37916

The curriculum incorporates several important concepts of programming. To help students adjust to the computer, the course begins with lessons on the immediate mode, turtle graphics and animation of cartoons. Lessons follow on the Rascal editor and how the language works, and then the more difficult concepts of variables, constants, procedures, loops using the Repeat-Until commands, nested loops, Boolean variables, If-Then-Else statements, arrays, For statements and the concept of top-down design and structured programming occur systematically.

The entire course takes one semester or 18 weeks to complete. Each lesson contains detailed lesson plans for each day of instruction; student activities and assignments; and supplemental readings. Instructors also get tutorials about equipment, INTERPAS, the editor, the filer, disk management and troubleshooting.

Final projects, called Blue-Sky Projects, occupy the last three weeks. Stu-

dents have a choice of Blue-Sky Projects, such as programs about computer clocks, creating polygons, pseudo-random-number generators, the creation of a shape menu or a typefont generator.

This course teaches programming skills as well as computer literacy, and encourages students to explore and discover as they learn. Graphics throughout the program provide visual reinforcement.

**PERFORMANCE:** Computer Power encompasses Logo-like features with the basic design of Pascal. The current belief that Logo and Pascal are easier for beginning students to learn and that they teach better programming habits is one of the main reasons why this program was developed.

This is a massive project. It took about two years to develop, with the assistance of a grant from the National Science Foundation. Because of its comprehensiveness, however, it is difficult to gain quick understanding of the organization of this large volume of material.

Without some sort of teacher training on Rascal and how to best use all the information, this curriculum could be somewhat overwhelming for inexperienced computer-programming teachers. On the other hand, Computer Power can be a useful learning tool if the teachers know how to handle the material.

An example of the difficulty in organizing such a large project occurs the first time you use Rascal. The introductory tutorials in the teacher's handbook don't caution you to remove the write-protect labels from the disks, and, if you don't remove them, you get the error message "bad worksheet." This can be a frustrating experience for novices who don't understand what has gone wrong. The Teacher disk from a lengthy file called "INTERPAS and Rascal Error Messages," which is probably not the first thing you'd read, contains an explanation of this error.

We found the Maker lesson, a tool for making figures, to be fun to use but not an especially good shape utility. You must draw your shapes with a swinging line that you can place wherever you choose. Once you have drawn a portion of the shape, how-

ever, the swinging line temporarily erases your shape. This becomes frustrating when you are trying to create a drawing, but you cannot see previously drawn parts of the drawing.

**EASE OF USE:** With proper in-service training and telephone access to knowledgeable people, teachers can easily use the basic aspects of this package. Learning the many special features, however, is a large project for inexperienced teachers. You have to install a special chip in order to make the program run.

Teachers must have a clear understanding of how the Rascal language works, including its compiler, editor and filer. No doubt, the completeness of this package will even impress experienced teachers who prefer doing

things their own way.

From the student's point of view, the program is easy to use.

**ERROR HANDLING:** The error messages included with this language are excellent and tell users what they have done wrong and how to remedy the situation. You can get hung up with the program if you do not remove the write-protect labels or if you type in the wrong date.

**DOCUMENTATION:** The documentation numbers over 600 pages, including a teacher's handbook, student text and the INTERPAS and Rascal reference manual. It is easy to get lost at first in the various tutorials, teacher lessons and student activities.

The student text is well written and easy to understand. The teacher's

handbook, however, is much more difficult to read and organized in an unusual manner. For example, the tutorials that you use first are in the middle of the manual, and the lesson plans come at the beginning. The answers for the sample quizzes come in a separate section well before the quizzes.

If the manual is revised, we suggest that the tutorials come first, the teacher's lesson plans next and the quizzes and answers (together) after the lesson plans. This more logical order would make the handbook easier to follow.

**SUMMARY:** Computer Power is a valuable teaching tool that requires a substantial commitment in hardware and teacher training. ■



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## Mini Memory, utility module for TI programmers

By Lawrence R. DeFlusha, Jr.

The Mini Memory is a software-development tool designed for the TI-99/4A or the TI-99/4 home computer.

It can store 4K bytes of data in the module's battery-powered RAM. It loads and links BASIC programs to assembly-language subprograms and comes with a cassette-based Line-By-Line Assembler. You can use the Expansion Memory for file handling if you have it attached to your system.

**FEATURES:** The Mini Memory is a command module that plugs into the cartridge slot on the console and requires a minimum system configuration: the console and a cassette

recorder. The cassette recorder is used for program storage and to load the Line-By-Line Symbolic Assembler program that accompanies the module on cassette.

This utility module is capable of data storage, allows assembly-language program development and provides TI BASIC subprograms and utility routines. In addition, the module contains Easy Bug, an assembly-language debugger.

The Mini Memory contains 14K bytes of memory: 4K bytes of battery-powered RAM, 4K bytes of ROM and 6K bytes of GROM (graphics read-only memory). Resident in the ROM and

GROM are the subprograms and routines.

You can use the battery-powered 4K RAM to store a small program. TI BASIC files or assembly-language subroutines. This battery power allows you to save any data stored in this module continuously without the module is plugged in or not. You must turn the console off before removing the module to prevent transients or static damage.

The TI BASIC subprograms include INIT, LOAD, LINK, PEEK, PEEKV, POKEV and CHARPAT. The UNIT subprogram is used to initialize the CPU memory when you plan to use

assembly-language subroutines.

You use the LOAD subprogram to load either an assembly-language object file into CPU memory or to load data into CPU memory. You can call the LOAD subprogram from TI BASIC with a CALL statement.

The LINK subprogram is used to pass control from a TI BASIC program to an assembly-language subprogram. You use the CALL LINK statement in the TI BASIC program to transfer control.

You use the PEEK subprogram to read bytes of CPU RAM directly into TI BASIC variables, whereas the PEEKV subprogram is used to read bytes of

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### Mini Memory

	Poor	Fair	Good	Excellent
Performance	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Documentation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Ease of Use	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Error Handling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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- TI-99/4 or 99/4A
- Cassette recorder

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Video Display Processor RAM. The two functions work similarly and access the two different RAMS.

To change data stored in the VDP RAM, you can use the POKEV subprogram. It functions in the same way as the CALL LOAD subprogram, which modifies CPU RAM.

When the 32K Expansion RAM is in the system, the Mini Memory allows direct access to its storage. The Mini Memory manual makes frequent reference to the Editor/Assembler manual.

See *Mini Memory*, page 48

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## Mini Memory

*continued from page 46*

This manual is not included, but you can purchase it from TI without buying the entire Editor/Assembler package. The Editor/Assembler manual is a basic requirement if the module is to be used correctly with assembly-language programs.

The utility routines resident in the Mini Memory allow access to machine resources and will interface with the TI BASIC Interpreter.

The "standard utilities" allow access to the video-display processor, linking with ROM/GROM routines. They also perform keyboard scanning.

The "Extended Utilities" are used to access the console ROM/GROM routines or utilities. They allow access to routines such as cassette device service routines, load lowercase characters set, and so on.

Three choices are displayed on the main menu: TIBASIC, MINI MEMORY and EASY BUG. If you select the Mini Memory option, another menu is displayed with the following options: LOAD AND RUN, RUN and REINITIALIZE.

The LOAD and RUN option loads assembly-language programs (developed with the Editor/Assembler) into memory and runs them. The RUN option runs a program that has already been loaded into memory. The final option is used to reinitialize the Mini Memory for loading a new program. If there is a program already loaded

when you select the third option, the message "MEMORY ALREADY INITIALIZED, HIT 'PROC'D' TO CONFIRM" is displayed.

The third selection on the master menu is Easy Bug. This program allows you to debug your assembly-language programs and access memory input/output ports of the 99/4A. When you select the Easy Bug option the screen displays the following:

### COMMAND TYPES ARE

```

MXXXX MODIFY CPU MEMORY
GXXXX DISPLAY GROM MEMORY
VXXXX MODIFY VDP MEMORY
XXXXX EXEC. ASSEMBLY PROGRAM
CXXXX CRU SINGLE-BIT I/O
    
```

XXXXX SAVE CPU MEMORY TO CSI (STARTING AT XXXX)  
L LOAD STORAGE FROM CSI

This summary of the commands is straightforward. The XXXX following each command is the hexadecimal address for you to specify. When you press any key the screen clears and then displays a question mark in the lower right corner, waiting for a command.

**PERFORMANCE:** The Mini Memory definitely enhances software development and operation with the subprograms and routines that are provided. All of the functions worked as indicated in the manual.

I loaded the Lines demo program into the Mini Memory and ran it. As noted in the supplemental literature,



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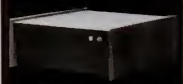
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the program will not work on the 99/4, the forerunner of the 99/4A. Indications are that some graphics routines may not be available to the old video-display processor.

The Lines program produces a series of various colored lines that randomly sweep the screen. I stored this program and several others in the 4K RAM, removed them from the console and left them on the shelf for several days. When I plugged them back into the console, they remained as stored in the battery-powered RAM.

To effectively utilize the assembler, you should have a good working knowledge of the TMS9900 assembly language. The Editor/Assembler from Texas Instruments provides the required reference material and information about the essential internal workings of the home computer.

I encountered no problems in the operation of the Mini Memory. Attention to detail when you work with the assembler is important to avoid crunching reserved memory.

**EASE OF USE:** The module format with ROM/GROM subprograms and routines is an excellent tool as far as ease of installation is concerned. The ease with which some of the utilities can be handled is dependent to a large extent on your programming knowledge. The drawback to the module format is that it prevents you from using the Mini Memory with any other module programs or with a language such as Extended BASIC.

**ERROR HANDLING:** The operating system maintains the normal error handling, and the module displays error codes, depending on the function being performed and the type of function.

**DOCUMENTATION:** The 83-page manual is excellent. It is designed to be easily read and understood. It contains needed references to other manuals, indicates how to use the manual and contains a table of contents and an index.

The introduction is a good overview of the features of the module and possible applications. It cautions the reader early that the power should be turned off when inserting or removing the module.

There are six appendices that include a CPU memory map, Mini Memory ROM organization, RAM organization—TI BASIC files, Mini Memory RAM organization, VDP RAM memory map and VDP RAM with TI BASIC Interpreter. Each is detailed enough to provide required information without unwanted detail.

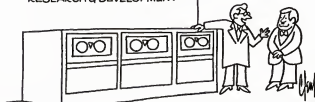
Also included in the manual are the terms of the warranty and information

about service.

Generally, I have found that TI documentation is very good. Once in a while something slips through that is less appealing. This is the case with the documentation for the Symbolic Assembler that accompanies the Mini Memory. The information is complete and there is sufficient detail provided. The form, however, could be improved. This consists of 17 folded photocopied pages enclosed in the package. This a small point, perhaps, but what could be the reason for handling it this way?

**SUMMARY:** I was impressed with the capabilities of this module. It provides many useful routines, subprograms and manipulation techniques for the 32K Expansion RAM. ■

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## Microfiles, a filing system for TRS-80 computers

By Dan Robinson

Microfiles is a computer filing system that allows your files to span from one drive to another, which gives your system increased capacity. Although not a full data-base management system, Microfiles is a good data storage/retrieval system that uses simple English words to command the program to perform its various tasks. It is ideal for the computer novice.

**FEATURES:** Microfiles can contain a number of separate data files, such as customer lists, sick-leave records, vacation schedules and the like. The program uses random-access techniques so that there is no limit on the number

of fields or their size. As the data base grows, Microfiles can create additional file extensions, up to a maximum of seven, with as many as 51 granules each. The capacity of the data file is limited only by the density and number of drives you have.

Microfiles contains commands that let you create records, to then either display the records on the screen or send them to the printer, where you have total control over their format. You can display, change or delete records and control the scrolling of data displayed on the screen. You can create or kill files, search for any required data or specify an index to present

data in any order you wish.

When you make changes in existing records, you can insert or delete individual characters to edit a data field. Insertions during the change mode retain all of the data that follows your insertion, which lessens the amount of keyboard entry.

You can designate fields as either optional or required. You get screen prompts for data entry in the required fields, and you must supply optional data with the change procedure after you have completed data entry. If you later change your mind, you can make required fields optional and vice versa. Unlike some full data-base-man-

agement systems, Microfiles has a random-access technique that permits you to designate additional fields after you have established the file.

The command words follow common sentence structure, such as "LIST ALL FILES." The Microfile vocabulary consists of familiar English words such as BUILD, CHANGE and DISPLAY; and you can abbreviate most of them once you are familiar with the program.

Although Microfiles does not automatically span drives, the program permits you to query the program to find out how much space remains in a file extension and allows you to create

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#### Microfiles

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Documentation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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#### System Requirements

- TRS-80, Model I or III
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Fort Worth, TX 76102

additional extensions, even on other drives. The potential capacity of a three-drive, double-density system approaches five million characters.

You can establish named formats for both screen and printer with Microfiles, so that you can access selected data for each record as your needs dictate. The formats can include the field names or any titles that you specify, and you can present data in any order, grouped on a line or separated. You can route data intended for the screen to the printer. Printer formats allow as many as 128 characters per line.

The printer formats support page headings, and Microfiles never splits a

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record between pages. You can establish a special format, which provides great flexibility and can contain information from several records.

Through the combination of indexing, searching and using specified printer formats, you can create reports of selected data easily, quickly and attractively.

There is no provision for integrating the file data with a word-processing program for form-letter production, nor is there a provision for mathematical manipulation of the data.

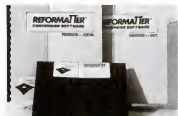
**PERFORMANCE:** Microfiles behaves quite well. Its ability to use more than one drive to store data is a definite plus, and the random-access techniques permit flexibility in adding or deleting fields even long after you have established the file. The sacrifice is that the system requires more memory than do sequential files, and manipulation of a large file is a bit slower.

**EASE OF USE:** You'll find Microfiles about as easy to use as any computer program yet developed. It employs English-word commands that, although limited, the beginner in data-file management can master. Since you can interrogate the program to see how much space remains in the file, you need seldom run out of room unexpectedly.

**ERROR HANDLING:** Microfiles has built-in error-trapping routines that make it difficult for anyone to have trouble with the program. Anyone who has ever had his computer hang up as it tried to write data to the disk after a long entry session will appreciate the Verify command, which tells Microfiles to write each record to disk as you enter it and avoids the hair-tearing possibility of lost data after an hour or so at the keyboard.

**DOCUMENTATION:** Microfiles comes with a 55-page manual in an attractive vinyl binder. The documentation, as for most Radio Shack

**Reformatter lets you transfer files between operating systems**



Model II users can now exchange data files and source programs with CP/M or DEC RT-11 systems using **Re-formatter** conversion software.

The file-transfer program lets you move files back and forth between the two operating systems and also provides you with complete file statistics for the target diskette. Reformatter lets you delete or rename files and alter user numbers.

Two versions of the program, TRSDOS for CP/M and TRSDOS to RT-11, are available from MicroTech Exports, 467 Hamilton Avenue, Suite 2, Palo Alto, CA 94301.

A TRSDOS to IBM version is available exclusively from Tandy Corporation through Radio Shack stores.

programs, is in the form of a training manual that leads you through the program step by step. The appendix contains a summary chart of commands for your reference.

**SUMMARY:** Microfiles does not offer as many functions as you usually find in a full data-base-management system such as AIDS, Maxi Manager or Radio Shack's own Profile. The program's main appeal is the ease of use for the computer novice. Buyers of the program must weigh the value of easy learning against the cost of purchasing a more advanced data-base-management system in the future, as their needs and experience increase. You should also consider the time it will take you to reenter the data base should you ever decide to move up. **E**

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PW 10

## Radio Shack

Think Software, a Canadian software company, has announced its first program, **Wall Street Tap**. The program graphically displays the performance of any stock in chart form. The package is designed to help investors and professional traders to look at the history of a stock so they can make buy-and-sell decisions.

According to the manufacturer, the program lets you "analyze stocks via point and figure, moving average and on balance volume (made famous by Joe Granville) charts." Users can "rec-

ognize developing trends and compare the performance of two stocks simultaneously."

You need a TRS-80 Model I or III with 48K and one disk drive to run the program. Think Software, Inc., #572-810 West Broadway, Vancouver, BC V5Z 4C9.

It's not exactly software, but it should make using Model II software easier. Nanos Systems is offering **Quick Reference Cards**. The latest reference aid is the TRS-80 Model II **Commands and Utilities Card**, which summarizes parameters for the

commands and utilities and arranges them alphabetically by function for quick reference. It costs \$3.95.

In addition, the **SVC Card**, which tells you how to invoke supervisor calls for the assembler-language programmer, is now available for \$2.95. These two new reference cards join the **Z80 Reference Card**, (\$4.95) and the Model II **BASIC and Assembler Card** (\$5.95) from Nanos Systems Corporation, P.O. Box 24344, Speedway, IN 46224.

## IBM

BIT Software is offering a **Forms Designer Package** for the IBM Personal Computer. The package helps programmers design and lay out forms and assists them in creating, storing and updating data files based on the forms they've created. The package contains three main programs: the **Forms Editor** lets you draw and erase lines and define fields and character attributes; the **Run-time subroutines** let you access forms and retrieve key-board entries; and the **Data Entry program** allows you to test the forms' layout or retrieve sequential data.

The package requires an IBM PC with 128K, the MS-DOS operating system and a monochrome CRT; it works with application programs written in Pascal, FORTRAN and Assembler. BIT Software, P.O. Box 619, 1048 Nicklaus Avenue, Milpitas, CA 95035.

InterLync is an advanced communications package that allows the IBM Personal Computer to emulate a terminal and to transfer files between the PC and other computers, including mainframes, CP/M systems and APL timesharing systems. The program op-

erates at baud rates from 110 to 9600.

A "data capture" function saves incoming text to a disk file, and the Xmodem block-transfer protocol lets the PC send and receive files from CP/M computers and from computer bulletin-board systems.

InterLync requires 128K, one disk drive and an asynchronous communications port. The cost is \$100 for the standard version and \$175 for the version that includes the APL option. Starside Engineering, P.O. Box 18306, Rochester, NY 14618.

Yes, you can play games on the IBM PC. Personal Computer Products is selling **Omegabug**, a game that features a pesky little critter of indeterminate gender who just wants to touch you. If it does, the game's over. Omegabug is selling at ComputerLand and other computer stores for \$29.95. Personal Computer Products, 1400 Coleman Avenue, Suite C-18, Santa Clara, CA 95050.

PC/Software has developed a new operating system that lets up to eight persons use an IBM Personal Computer at the same time. The **QUNIX Operating System** also contains a full-screen text editor and a text formatter. There are actually five QUNIX operating systems tailored to the needs of different users. They range in price from \$350 to \$950. PC/Software, 926 Natoma Street, San Francisco, CA 94103.

The **IBMPC/8087 Numeric Support System** lets users write programs on their IBM Personal Computers that put the optional 8087 coprocessor chip to work. IBM PCs are now sold with an empty socket that accepts the Intel 8087 chip. In concert

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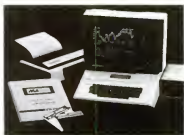
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with the main PC processor chip, the Intel 8086/88, the 8087 chip can perform high-speed arithmetic operations.

Users can extend the Macro Assembler supplied by IBM to include the 8087 instruction repertoire, and all addressing modes of the 8086 are supported, according to manufacturer Southwestern Data Processing. No preprocessing or linking is required to use the system, the firm says. The price is \$49.95. Southwestern Data Processing, P.O. Box 40876, Tucson, AZ 85717.

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stocks.

The package is written in Pascal and runs on the Apple II and II Plus computers equipped with a 16K RAM card, a color or black-and-white monitor and one or more disk drives. The package also supports a printer and the D.C. Hayes Micromodem (or communications card and external coupler). The price is \$395. Anadita, 613 Jaeger Court, Sickleville, NJ 08081.

Quark Engineering has developed three new programs for the Apple III. Catalyst is a boot program for hard disks that eliminates the need for

swapping and rebooting floppy disks "when you want to go from VisiCalc to Word Juggler, Word Juggler to Pascal, Pascal to BASIC and so on," according to Quark. Catalyst costs \$149.

Discourse is a software spooler that lets you "print" lengthy reports to disk rather than waiting for the printer to crank them out. Once the document has been put on disk, you can use the computer for other tasks. The program works with most Apple III software; it requires a hard disk or external floppy-disk drive. The price is \$125.

See Apple, page 54

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## Apple

*continued from preceding page*

The Legal Dictionary is an accessory to Lexicheck (the spelling checker for the Word Juggler word processor, which Quark also sells.) Legal Dictionary adds 8000 legal terms to the Lexicheck dictionary. It costs \$125. Quark Engineering, 1433 Williams, Suite 1102, Denver, CO 80218.

MIN Microcomputer Software has upgraded an earlier real-estate program to manage any kind of income property. The Landlord 2.0 manages apartments, marinas, offices, retail space, shopping centers, single-family homes and other kinds of property including aircraft hangars and trailer



The Landlord, an updated version of a property-management program

parks. It maintains up to 590 tenants.

The program requires an Apple II with 48K, two disk drives and an 80-column printer. The cost is \$795. MIN Microcomputer Software, Inc., 1501 Johnson Ferry Road, Suite 220, Marietta, GA 30062.

She loves me, she loves me not. A new software product called Rank Master lets you use your Apple II to help decide the answers to real-life problems. The program lets the decision maker "consider qualitative factors for which there are no standard sets of measures," thus enabling him to use his own knowledge to resolve complex problems.

Reportedly, the program is good for setting priorities, analyzing preferences, allocating resources and assessing the impact of policies. The price is \$195. Decision Software, 725 Cowper #46, Palo Alto, CA 94301.



Computer SAT helps college-bound students to prepare for their Scholastic Aptitude Tests.

Now your Apple can help you cram for the Scholastic Aptitude Test (SAT) exams so you can get a high score and go to the college of your choice. Harcourt Brace Jovanovich is offering Computer SAT, a computer package that leads students step-by-step through the test-preparation process. The program diagnoses the student's strengths and weaknesses, prepares a study plan and guides him through a comprehensive set of study exercises.

The program runs on the Apple II and II Plus; it costs \$69.95. Harcourt Brace Jovanovich, Inc., 757 Third Avenue, New York, NY 10017.

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# Model III Disk-drive kit from A.M. Electronics

## By Vic Frump

There are several drive kits offered for the TRS-80 Model III, including Radio Shack's. A few require the supplier to do the installation, and some do not offer the disk-drive kit as a separate option (without any disk drives). I selected the A.M. Electronics Disk Drive kit because of its competitive price. You can buy just the basic kit or the kit complete with drives.

The TRS-80 Model III tape system is far superior to that of the Model I. You experience fewer problems with loading, and the ability to select 1500 baud over 500 baud does speed up the CLOAD and CSAVE process. If you

Now the computer is apart. The next step is to remove the faceplate to allow access to the drives! If you wish, you can remove the plug from the CRT board and separate the two sections to allow yourself more room to work. You remove the faceplate by cutting through the plastic at the locations shown in the instructions in figure 2. (Yes, there are ample amounts of figures and drawings to guide you through the entire process.) Be sure to study the figure and cut at the proper point. If you are installing only one drive, then cut out the bottom opening only.

You are now ready to remove the ca-

bles and screws from the main logic board and remove the entire board, so you can install the disk-controller board between the chassis and the main logic board.

Next we come to the only problem I had with the installation. The instructions said to mount the disk-controller board using the hardware in package 2. Well, package 2 had four screws and there was no place to screw them in. There were four holes in the chassis that corresponded to the four holes in the board, but there would have to be some kind of standoff to insulate the board from the chassis.

I called Gary at the A.M. Electronics

service department. I hadn't even fully described the problem before Gary had the answer. The Model III that I have is one of the early versions. On this version the disk-controller board mounts on four standoffs and therefore requires different hardware. Gary said he would mail the standoffs.

While I was waiting for the mounting hardware I completed the balance of the installation. I installed the power supply as indicated and the disk-drive mounting hardware.

This installation was for two drives. When I tried to install drive 0 (the bottom drive), I found that the power-

See Disk-drive kit, page 56

## Model III Disk Drive Kit

### System Requirements

- TRS-80 Model III
- Any Model III DOS
- 32K RAM

Price: \$390 for kit (drives not included)  
\$205 for 40-track drive

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have used disk systems before, however, you will never be satisfied with tape only.

**FEATURES:** The Model III Disk Controller kit consists of everything you need to convert your Model III to disk with the exception of the actual disk drives! The kit includes the disk-controller board, disk-drive mounting brackets, power supply for two drives, hardware, cable and instructions. If you order drives with the kit they are configured for the Model III and are ready to install as received. These drives can be single or double sided and 40 or 80 track.

The DOS you use must be capable of addressing the additional tracks. Four 80-track, double-sided internal drives? Boy! That's more than 1.47 megabytes! **SETUP:** As with any project, you should read the instructions completely before proceeding with the actual installation. When I opened the shipping box I found each item carefully packed, and all hardware packages were numbered. I checked all the parts against the parts list in the instruction manual and found everything complete.

The instructions list the tools required for installation as a Phillips screwdriver, straight screwdriver and wire cutters. The instructions include the normal caution against static-electricity damage to the disk controller and CPU board.

The next step is the disassembly of the Model III. This consists of removing several screws from the bottom and back of the computer and lifting off the top. No problem, but I think a caution should have been included at this point because of the small clearance between the CRT neck and the vertical-mounted chassis in the computer. The supplier did touch on this potential problem in the reassembly instructions.



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## Disk-drive kit

continued from preceding page  
supply transformer hit the bottom of the drive. Moving the power supply to the farthest-left position did not give the clearance required. I then removed the transformer, rotated it 45 degrees clockwise and bolted it in the new position. Presto: plenty of clearance and all secure.

I ordered two Tandon 40-track drives with the kit. When I unpacked them they were configured and ready for installation.

The terminating resistor had been removed from one drive. The instructions did not indicate which drive should be drive 0, nor were they marked. I had been told that the

Model I terminating resistor could be in any drive. I thought that this could be the case for the Model III, so I put the drive with the terminating resistor in drive 0. This was wrong. It will cover this more completely under Documentation.) I completed the installation of the drives, rechecked my work and waited for the new hardware.

After receiving the hardware, I installed the disk-controller board and the main logic board in a few minutes. I plugged in all the cables and jumpers, and I was ready to place the top into position.

One problem: The cable to the monitor section was sticking out between the top and bottom. Well, that wasn't really a big deal. I just lifted up the top, tucked in the cable and lowered the

top back into place.

I was anxious to get the drives spinning, so I quickly tightened all screws, plugged in the power cable and set the power switch to on. Then I inserted a DOS diskette (not included with the kit) and pressed reset. The drive I thought came on and went out—nothing. When I removed the top, I found a plug to the logic board had been pulled out by the CRT when I lifted the top up to tuck in the monitor cable.

**PERFORMANCE:** It's nice when you buy something and it works as advertised with no major problems. The drives run quietly, error free. After using a Model I for more than four years, it seemed strange to see 175 granules free on a system diskette and 233 granules free on a formatted diskette. A

granule is 768 bytes on the Model III, but 1280 on the Model I. You still end up with approximately 1.8 times the disk storage space on the Model III over the Model I with 40-track drives.

After the drives were installed, the computer was left on—about 14 hours a day, 7 days a week—with no problem. During that time it received intermittent use.

**DOCUMENTATION:** The instruction manual consists of 13 pages, of which 7 pages are drawings. The instructions are clear, concise and logical. I had to read some paragraphs a couple of times to let them "sink in," but it's all there well, almost.

One point not covered at all in the instructions was which drive got the

See Disk-drive kit, page 61

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## October 4, 1981

## Disk-drive kit

*continued from page 36*

terminating resistor. I called A.M. Electronics service and again talked to Gary. The main purpose of this call was to get information about where to go for service for the equipment sold by A.M. or its dealers. While I was talking to Gary I asked about the terminating resistor. He stated that one and only one resistor should be present and that should be in the drive with the highest number. After receiving this information I had to remove the cabinet, change the resistor from drive 0 to drive 1 and reinstall the cabinet. (I'm getting pretty good at this.)

I also found another point not covered in the instructions: You can use

two double-sided internal drives with the cable supplied. All output from the controller board is from the top connector. The bottom connector is not implemented at this point. If you wish to use external drives, you must use an A.M. 4-drive cable or one with no "pins pulled." Radio Shack's cable will not work in this configuration.

I was told that a new installation manual is now in process and should be available shortly. This manual is alleged to correct the omissions of the previous manual.

**SERVICEABILITY:** The Disk kit (including the Tandem drives) are warranted for 90 days. You can obtain service through A.M. Electronics or one of its authorized service centers. At present there are service centers in

Florida; Kansas; and Quebec, Canada. I understand that more service centers are soon to be established. You can return the disk-controller board, power supply or any part of the kit individually for service.

**SUMMARY:** This kit is complete, the PC board is of high quality, the instructions good and the installation easy. The documentation missed an "excellent" rating because of the omission of information on the terminating resistor and on the external drives.

The kit and disk drives are available from A.M. Electronics or any of its many dealers. Pricing may vary between dealers.

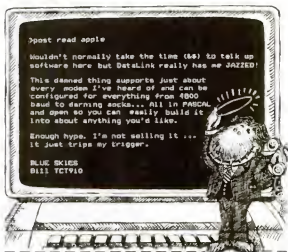
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### New systems

Texas Instruments has announced a new line of multiuser desktop computers, the **Business System 300**. The new computer series has a faster CPU and more mass-storage options than TI's comparable DS990 Models 3, 4 and 5 computers. The System 300 uses TI's TMS99000 microprocessor; it has 128K of main memory, expandable to 512K.

TI dealers will carry application software for the new computer series, including accounting and payroll packages and word processing. Up to three people can use the system in its expanded form.

The flexible new systems come with Winchester hard-disk drives and can be used with a variety of communications and printer options, according to the manufacturer. Single-quantity prices range from \$9995 to \$21,800.

TI has also reduced the price of its single-user Business System 200 Series by as much as 20%, bringing the low-end System 220 computer (with two 600K floppy-disk drives) in under \$5000. Texas Instruments, Dealer Operations, P.O. Box 2909, M/S 2216, Austin, TX 78769.

Kontakt, the new Mitel executive work station, combines electronic mail, time management, financial planning, data communications and word processing with voice telephony. The new Canadian-made computer system can operate with any analog telephone system. The Kontakt work station is a business communications link that can integrate an executive's work station with the work station of an administrative assistant or associate.

The hardware includes a 12-inch



Contact, from Canadian-based Mitel, is an electronic work station that also features voice telephony.

display, 5¼-inch floppy-disk drive, a built-in modem and equipment to create a "micro-network" local-area network for two people. A spreadsheet program, word processor and BASIC programming tool come with the system. Mitel Corporation, 350 Leggett Drive, Kanata, Ontario K2K 1X3.

The **Masterkey 2301**, small business computer features a 40-megabyte hard-disk drive and four-user capability. The 2301 uses the 6502 operating system and a unique dual-processor CPU composed of the 6502 and Z80 microprocessors. Two parallel and four serial input/output ports, as well as one Keyring network port are included in the Masterkey 2301 system. The unit retails for \$11,975. M/A-COM Office Systems, Inc., 7 Oak Park, Bedford, MA 01730.

The **Ardent 15** is Ardent's newest 16-bit "desktop minicomputer." The unit's CPU is compatible with IRIS, BITS, IOS, BLIS/COBOL and several other operating systems. Standard features of the Ardent 15 include master-port visual display, detached keyboard, virtual console, real-time clock, parallel-line printer controller and four auxiliary RS-232 ports.

The computer also accommodates four additional user terminals through serial RS-232 links. The list price is \$4990 in single quantities. Ardent Computer Products, 2259 Via Burton, Anaheim, CA 92806.



The Ardent 15, a 16-bit desktop computer that accommodates four additional user terminals

### New peripherals

An inexpensive version of the Texas Instruments **Module (TIM)** voice synthesizer is being offered by Centigram Corporation. The TIM has one voice channel and is compatible with

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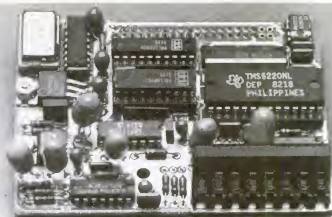
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You can use the synthesizer with telephone lines and for nonvoice audio signals such as sound effects or music. Some possible uses for the de-

vice include computer-aided instruction, operator prompting and industrial alarms—even voices for robots. Single unit price is \$350. Centigram Corporation, 155A Moffett Park Drive, Sunnyvale, CA 94086.

*InfoWorld is unable to test every product announced in this section. All claims attributed to the products have been made by manufacturers or by firms marketing these items.*

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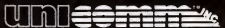
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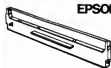


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## Usasi battles base-9 Mayan math mystery

By Michael Swaine, IW Staff

Still sitting in the coffeehouse/bookstore where they had heard the lecture on the archaeology of the Yucatan peninsula; solved the base-ten part of the Mayan math mystery; met a seven-year-old dice hustler; and solved one of her two dice puzzles, Mr. Usasi and his assistant, Casey Standard, were drinking tea and cappuccino respectively and tying up some loose ends.

Ms. Standard and a man named Elmo S. Loon, who had been sitting at the next table, were waiting for Mr. Usasi to prove that the Mayan cryptogram has no solution in base nine.

Mr. Usasi sighed. "If you insist. It is quite simple, really. Let me see, it was a multiplication problem, and looked like this, I believe." He wrote the problem on a napkin.

ANSI  
CT  
MOONT  
OHOI  
SSTM

"The key, as in the base-ten case, is in seeing that both digits of the multiplier, CT, leave the last digit of the multiplicand, ANSI, unchanged. T times I ends in I, and so does C times I. How many such pairs of numbers T and C have this property? Let's examine the multiplication table."

"That's not a base-nine multiplication table," Casey Standard objected as he wrote more on a napkin.

	1	2	3	4	5	6	7	8
1	1	2	3	4	5	6	7	8
2	2	4	6	8	1	3	5	7
3	3	6	1	5	9	0	4	6
4	4	8	3	7	2	6	1	5
5	5	1	4	2	7	3	8	4
6	6	3	0	6	3	0	6	3
7	7	5	3	1	8	6	4	2
8	8	7	6	5	4	3	2	1

He conceded the point. "That is correct. It is a base-nine multiplication table, modulo nine. In other words, it contains only the final digit of each product. But it will serve our purpose, I believe." He circled four numbers in the table.

"If we consider the values on the left margin to be possible values for I and the values across the top as possible values for T and C, only these two pairs of values work. A quick look at the problem shows that neither T nor C can be equal to 1, which eliminates the entire left column. Also, T must be larger than C, since it produces a longer partial product, so T will be to

the right of C in the table."

"So it's got to be either T=7 and C=4 and T=3, or else T=7 and C=4 and T=6," said Elmo S. Loon.

"Quite correct. But you see, I am sure, that this means that we already know the multiplier; it must be 47."

Casey Standard nodded, now standing and looking over his shoulder.

"And I is either 3 or 6."

"From this point on, we need only consider the last three rows of the problem: the addition of the two partial products. Suppose I is 3. Then we have this." He unfolded the napkin and wrote on an unused corner.

MOON3  
OHOI3  
SSTM3

"Consider the addition in the center column. It is the key. First, is there a carry from the column on its right?"

"There must be," Casey Standard answered. "O + O has to be an even number; it's just 2 x O. But there's a 7 below it."

Elmo S. Loon agreed. "Yeah, and look if that's true, O has to be 3, because 3+3+1=7. Oh, but O can't be 3. Not if I is."

"Ah, but this is base 9," said Mr. Usasi. "Not all numbers ending in 7 are odd. With a carry, Mr. Loon is correct: only 3 will do; and it will not do at all. But if there is no carry, could O be 8? In base 9, 8+8 is written as 17."

Mr. Loon rubbed his chin. "But I think you got a problem over in the left column, there. If O is 8, what can S be? It can't be 9; there ain't no such animal in base-9 arithmetic."

Casey Standard had stepped to the counter to get another cappuccino, her seventh, keeping an eye on Mr. Usasi's napkin all the while. "So I can't be 3," she said, returning. "You've cut off that branch. Now you have to do I=6."

Elmo S. Loon said. "Well, O still can't be 8 for the same reason."

"Let me see that thing," Casey Standard said as she sat down, pulled the napkin in front of her and studied it. "I got it," she said.

Mr. Usasi sipped at his fifth cup of tea—he drank more slowly than his assistant.

MOON6  
OHOI6  
SSTM6

"You got it?" Elmo S. Loon asked her.

"Yeah, look: you've got 3+H=S and also 3+M=S. There's no carry to the first of these, so there must be a carry to the second, or H would have the same value as M. Now, if there's a carry from 3+H, H must be at least 6. But 6 and 7 are taken, so that only leaves 8. But if you let H=8 and follow through the addition, it means that M has to be 7, and that's used up already. So we've already proved that I can't be 3."

She stopped for breath, scowled at her cappuccino, and pushed it away. "I'm getting too much caffeine," she said. "So you were right, boss; the base-9 case was easy. What was the base-10 solution again?"

Mr. Usasi took the napkin she had brought back with her cappuccino. "It was as follows," he said. "With M standing for 1; A standing for 2; G standing for 3; no instance of 4; I standing for 5; N standing for 6; T standing for 7; O standing for 8; S standing for 9; and H standing for 0."

"Yeah, yeah, I see. And you still claim you learned base-9 arithmetic doing secret research for Apple Computer, right? But what about those dice puzzles?"

"A suitable topic for the drive back to the city," he said, and stood up. "Mr. Loon, I hope we meet again."

The Mayan math mystery inspired some reader analysis above and beyond the stated problem. Richard Polunsky called from his office, where he edits the *Houston Symphony* newsletter, to ask why the problem had not included the base-12 and base-14 cases, which he had eliminated.

Next week's mystery calls for only the most elementary mathematical skills, but requires the ability to reason wrong-side-out. Forth programmers should do well with it.

## Next Time

On October 9, 1982, the Forth Interest Group (FIG) will hold its national convention. Also this month, the work of the Forth Standards Team is proceeding toward the development of Forth 83.

In our next issue we'll take a close-up look at Forth. We'll talk to its developer, Charles Moore, and find out if he is satisfied with the way his language is applied.

We'll look at the Forth Interest Group to learn what it is doing to aid users of Forth. We'll see if the Forth Standards Team has been able to convince those who use the language to follow its guidelines.

Forth is controversial. In order to present the many sides of the Forth debate, we invited three experts to participate in a viewpoint showdown. You can judge for yourself.

Software reviews will include the Computer Chef from the Software Toolworks, and we'll have a hardware review of Texas Instruments' TI 99/4A.

## Errata

We neglected to give a complete cover credit for our September 27 issue. The robot arm in the cover photo was provided courtesy of Automatic Clamping Devices, Menlo Park, California.

Our review of Math\* from Force Two Ltd. *InfolWorld*, September 20, 1982 listed the price of the product as \$49.95. The correct price, however, is \$149.95.

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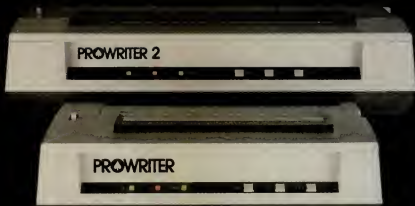
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